A WORKBOOK FOR

Arithmetic We Need



CURRICULUM

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CURR HIST

A WORKBOOK FOR ARITH

GRADE FIVE

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Classified Summary

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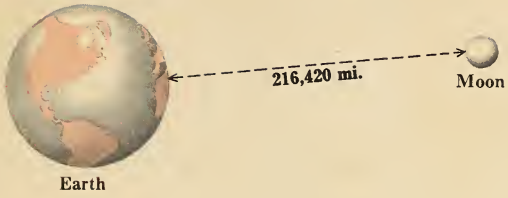
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For a chart showing the relationship between Workbook and Textbook, see inside back cover

1 Can You Build and Write Large Numbers?



1. When the earth and the moon are nearest together, the distance between them is 216,420 miles. In the box below, each figure in 216,420 is written under its place-value name.

216,420 is read, "Two hundred sixteen _____, four hundred _____."

Place Value	Hundred thousand	Ten thousand	Thousand	Hundred	Ten	One
1.	2	1	6	4	2	0
2.						
3.						
4.						

Write these numbers under the place-value names in the box above:

2. Fifty-six thousand seven.

3. Seven hundred thousand fifty.

4. Sixty-five thousand nineteen.

5. Put in the commas.

a. 67894 c. 5000

b. 896568 d. 900705

6. Write the largest

a. 4-place number. _____

b. 5-place number. _____

c. 6-place number. _____

7. Write the number we get when we

a. add 1 to 999. _____

b. add 1 to 9,999. _____

c. add 1 to 99,999. _____

8. Write the missing numbers below.

a. 6,650
6,750
_____
6,950
_____
7,150
_____

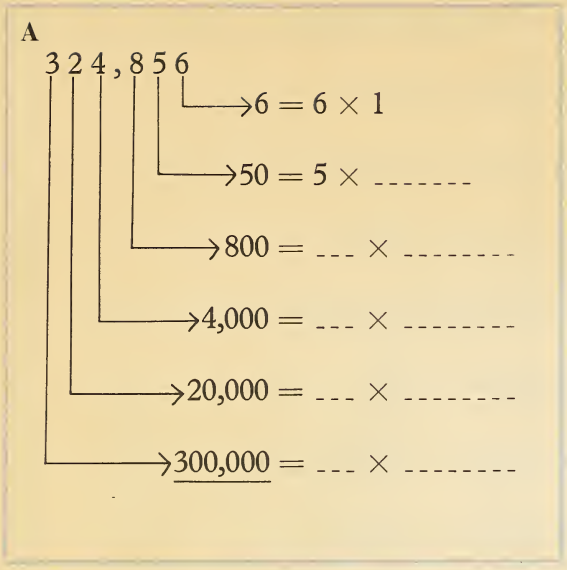
b. 95,003
94,003
_____
92,003
_____
90,003
_____

c. 54,804
_____
56,804
_____
59,804
_____

d. $467.02
$477.02
_____
$497.02
_____
$517.02
_____

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Can You Take Large Numbers Apart?



1. In box A, fill in the missing numbers to show how you find the value of each figure in 324,856.

2. What number will you get when you put the parts together again? Write it under the line in box A.

3. Box B shows the parts of a number. Put the parts together to find the number and write it under the line in box B.

B

400,000
80,000
9,000
200
60

4. How much larger is 6,836 than 6,036?

8 hundred, or _____.

5. How much smaller is 40,289 than 47,289? 7 _____, or 7,000.

6. How much larger is 34,654 than 30,654? _____

7. For each row below, do as is shown in the first row. First look at the pair of numbers in columns **a** and **b** and write their difference in column **c**. Then in column **d**, write the number that is 2,000 larger than the number in column **a**.

a	b	c	d
853	803	50	2,853
6,478	6,078	_____	_____
7,392	7,302	_____	_____
9,050	9,650	_____	_____
6,005	6,705	_____	_____
2,074	2,004	_____	_____
37,952	30,952	_____	_____
40,218	46,218	_____	_____
61,572	61,072	_____	_____

8. Write the money numbers below in order of size, with the smallest number on the top line.

$1,396.15 _____

$3,000.00 _____

$396.75 _____

$3,714.96 _____

$324.00 _____

$1,258.16 _____

$3,000.48 _____

Do You Know the Addition Facts?

To add quickly, you must know the addition facts. Write the sums for rows 1 to 3.

	a	b	c	d	e	f	g	h	i	j
1.	5	4	7	2	6	7	2	5	6	9
	+5	+8	+2	+4	+3	+3	+9	+3	+4	+6
2.	8	9	4	7	5	9	2	7	5	1
	+6	+7	+9	+4	+8	+5	+8	+8	+6	+9
3.	7	8	5	4	3	4	9	7	1	5
	+5	+9	+4	+4	+8	+7	+9	+6	+8	+9

TO HELP YOU WHEN YOU ADD

a. When you add 0 and another number, the sum is the other number.
b. When you add 1 and another number, the sum is "up 1."
c. When you add 2 and another number, the sum is "up 2."
d. When the numbers to be added are nearly equal, you can use a double.
e. When the sum of any two 1-place numbers is more than 10, you can find the sum by making a 10-group and then adding the ones that are left.

Using Addition Families

In row 1, there are not enough ones to make another ten. The examples are in the 5 + 3 A. family. Write the sums.

	a	b	c	d	e
1.	15	85	5	65	5
	+3	+3	+53	+3	+43

Write the sums.

2.	25	34	6	7	26
	+4	+2	+13	+41	+2

In row 3, the ten's figure in each sum is "up one." Write the sums.

3.	26	18	5	8	49
	+7	+2	+25	+39	+3

Write the sums. For 38 and 5, you can *think*, "13, 43." It is quicker just to look at 38 and 5 and *think*, "43."

	a	b	c	d	e
4.	38	39	9	8	44
	+5	+7	+25	+16	+8
5.	27	13	74	4	6
	+3	+8	+9	+85	+34
6.	17	31	24	38	7
	+9	+9	+6	+4	+54
7.	63	16	28	64	7
	+6	+5	+7	+7	+85

Carrying Tens and Hundreds

1. Can you carry tens and hundreds correctly in adding? Finish the work started in boxes A and B.

A

Hundreds	Tens	Ones
	1	
4	8	9
+ 2	0	7
		6

Helper

Tens	Ones
	9
+	7
(1)	6

B

Hundreds	Tens	Ones
	1	
5	7	4
+ 2	8	3
	5	7

Helper

Hundreds	Tens	Ones
		74
	+	83
	(1)	57

2. Box C. The sum of the ones is _____, or 2 _____ and 4 _____. Write "4," carry ____ tens. The sum of the tens is _____. Write "5," carry ____ hundreds. Finish the work.

C

289
368
+ 297

Write sums for rows 3 to 6. Try to carry without writing the number carried.

	a	b	c	d
3.	584 + 863	753 + 128	57 + 538	860 + 159
4.	796 + 875	986 + 54	375 + 897	458 + 568
5.	967 75 + 848	439 54 + 897	675 839 + 54	743 297 + 185
6.	759 876 948 + 89	839 56 487 + 394	275 376 97 + 548	85 315 96 + 488

Problems in Addition



Find answers for problems 1 to 4 and write your answers on the lines after the problems.

1. How many pets in all are there in a pet show that has 15 dogs, 18 cats, 7 birds, 4 rabbits, and 9 chickens?

_____

2. A fifth-grade class made booklets about pets. They used 32 sheets of red paper and 128 sheets of white paper. In all, they used how many sheets of paper?

_____

3. There were 18 booklets about dogs, 6 about cats, and 4 about rabbits. How many booklets were there about all these pets?

_____

4. Mary read a 25-page story about a pet monkey. Betty's story about a pet pony is 8 pages longer than Mary's. How many pages has Betty's story?

_____

Can You Carry Thousands Correctly in Adding?



1. There were 1,740 people at the circus on Friday and 2,510 on Saturday. How many people saw the circus on both days?

Box A. The sum of the hundreds is _____. We write ____ and carry 1 thousand. The sum of the thousands is _____.

A

Thousands	Hundreds	Tens	Ones
1			
1,	7	4	0
+ 2,	5	1	0
4,	2	5	0

2. In box B, you must carry three times. Finish the work. Add downward.

3. Check Ex. B by adding upward. Do you get the same answer?

B

	2	3	2
1,	5	8	6
9,	8	7	9
7,	3	9	4
+		6	4

For rows 4 to 7, add downward. Check by adding upward.

	a	b	c
4.	7,396 +4,518	9,056 +875	3,945 +874
5.	7,569 3,075 +963	4,870 968 +7,549	2,197 5,846 +4,372
6.	75,968 13,479 2,864 +30,794	8,479 30,687 5,943 +17,856	39,754 826 1,589 +78,436
7.	70,594 6,387 14,598 +7,365	807 4,967 18,759 +63,895	88,042 3,798 45,260 +9,576

Copy Ex. 8 to 10 in columns and add. Be careful to copy ones under ones, tens under tens, and so on.

8. 19,345 + 27,862 + 7,548 + 32 **8.** **9.** **10.**

9. 784 + 3,097 + 15,078 + 89,007

10. 476 + 9,532 + 78 + 50,677

11. Write in figures:

a. Seventy thousand twenty _____

b. Fifteen thousand one _____

Counting Money and Adding Money Numbers



Fred's Money

three $1 bills = $3.00

2 half dollars = _____

a quarter = _____

3 dimes = _____

a nickel = _____

Total _____

1. How much money has Sally? As she counted, she said, "$1.00, $1.50, _____, _____, _____, _____."

2. The box under the picture tells you what bills and coins Fred has. Finish the work and write the total.

In Ex. 3 and 4, add to find how much money each child has. Be sure to keep decimal points in a straight line. Check by counting toy money.

3. Mary's money

a $1 bill = _____

3 quarters = _____

4 dimes = _____

2 nickels = _____

Total _____

4. Frank's money

a $10 bill = _____

4 quarters = _____

5 nickels = _____

3 cents = _____

Total _____

Study Ex. 5a and 6a. Then work the rest of the examples and check by adding upward.

	a	b	c	d	e	f
5.	$14.35	$8.73	$69.58	$0.67	$75.29	$93.57
	0.89	47.89	56.14	87.51	0.15	68.49
	+48.76	+0.07	+8.97	+3.96	+8.96	+12.88
	$64.00					
6.	$596.76	$864.95	$83.76	$739.15	$19.68	$639.58
	37.52	148.36	409.80	276.59	429.52	127.43
	4.89	29.78	75.98	47.82	81.08	520.67
	+60.85	+6.54	+4.36	+369.51	+139.75	+497.08
	$700.02					

Copy these numbers in columns; add and check:

7. $38.94, $6.09, $40.70
8. $56.48, $15.92, $87.49
9. $689.45, $31.06, $5.98

7. 8. 9.

Do You Know the Subtraction Facts?

Write just the remainders for these subtraction (S.) facts:

	a	b	c	d	e	f	g	h	i	j
1.	7 − 4	9 − 8	8 − 6	9 − 5	8 − 3	15 − 6	10 − 3	17 − 8	12 − 7	10 − 5
2.	15 − 8	10 − 4	16 − 9	14 − 8	13 − 6	11 − 4	13 − 5	12 − 8	11 − 7	14 − 9
3.	10 − 6	16 − 7	18 − 9	8 − 5	12 − 9	16 − 8	11 − 6	15 − 9	10 − 8	15 − 7

The facts in Ex. 4 below are **related facts.** Together they make the **whole story** for 9, 6, and 15. Finish the whole stories started in Ex. 5 to 7.

4. $9 + 6 = 15$ $6 + 9 = 15$ $15 - 9 = 6$ $15 - 6 = 9$

5. $14 - 8 =$ _____ _____ _____ _____

6. $7 + 8 =$ _____ _____ _____ _____

7. $17 - 9 =$ _____ _____ _____ _____

---

8. Jim had 18 marbles. He gave 9 to Fred. Then Jim had ____ marbles left.

9. Did Jim give away half of his marbles?

_____

10. Sam bought a ruler for 12¢ and a pencil for 4¢. He spent _____ altogether.

11. How much less did Sam spend for the pencil than for the ruler? _____

TO HELP YOU WHEN YOU SUBTRACT

a. To find any S. fact, you can use some other fact in its whole story.
b. When you subtract 0 from another number, the answer is that number.
c. When you subtract a number from an equal number, the answer is 0.
d. To find a S. fact which is almost like a double, you can use the double.
e. To subtract from a teen number, you can think of the number as a 10 and some ones. Subtract first from the 10. Then add the ones to that remainder.

Using Subtraction Families

Subtraction families are helpers in finding remainders.

In row 1, the examples are in the 9—5 family. You can subtract the ones, so the ten's figure in each remainder is not changed. Write remainders.

1.	19	39	79	59	99
	−5	−5	−5	−5	−5

In row 2, the examples are in the 17—8 family. There are not enough ones to subtract from. The ten's figure in each remainder is "down 1." Write the remainders.

2.	17	87	47	67	37
	−8	−8	−8	−8	−8

Write the remainders for the examples below. Under each pair of examples, write the family helper.

3. 48 − 9 = _____ 28 − 9 = _____

Helper: 18 − 9 = 9

4. 36 − 7 = _____ 76 − 7 = _____

Helper: _____

5. 49 − 3 = _____ 99 − 3 = _____

Helper: _____

6. 80 − 4 = _____ 20 − 4 = _____

Helper: _____

7. 35 − 7 = _____ 65 − 7 = _____

Helper: _____

Write the remainders for rows 8–12.

	a	b	c	d	e
8.	23	60	77	90	65
	−9	−4	−8	−7	−6
9.	35	57	25	43	42
	−8	−6	−9	−8	−5
10.	78	43	40	52	71
	−8	−7	−5	−9	−2
11.	27	40	47	24	32
	−4	−6	−9	−8	−7
12.	91	63	39	54	88
	−8	−5	−4	−6	−9

Work these problems and write your answers on the lines after the problems:

13. Don delivers 9 papers on Pine Street and 26 on Spruce Street. How many more papers does he deliver on Spruce Street than on Pine Street?

_____

14. In all, Don has 60 customers. When he has collected his weekly bills from 8 customers, how many more are there to collect from?

_____

15. Last summer, Don had 58 customers. One month 5 of his customers were away. How many papers did Don have to deliver each day that month?

_____

Can You Borrow a Ten and a Hundred Correctly?

1. Box A shows how to borrow a ten. The borrowing changes 6 tens and 3 ones to ____ tens and _____ ones.

2. In box B we have borrowed a _____.

3. In box C, step 1, you must borrow a ten, or _____ ones. $10 + 6 =$ _____ (ones). $16 - 9 =$ ____.

In step 2, you must borrow 1 hundred, or 10 _____. $10 + 4 =$ _____ (tens). Finish the work.

4. Finish the work in box D. Watch step 2!

5. In box E, to subtract ones, you must change 800 (80 tens) to 79 tens and 10 ones. Subtract, and write the answer in the box.

Subtract in rows 6 and 7. Try to borrow without writing the changes.

A

Hundreds	Tens	Ones
	5 (13)	
8	~~6~~	~~3~~
− 3	4	7
5	1	6

B

Hundreds	Tens	Ones
	8 (12)	
~~9~~	~~2~~	8
− 6	7	5
2	5	3

C

	Step 1	*Step 1 and Step 2*
	4 (16)	6 (14) (16)
	7 ~~5~~ ~~6~~	7 ~~5~~ ~~6~~
−	1 8 9	1 8 9
	7	7

D

	0 (14)
	6 ~~1~~ ~~4~~
−	3 7 5

E

	8 0 0
−	7 5 4

	a	b	c	d	e	f	g	h
6.	8 7 4	5 4 9	9 5 3	8 6 9	9 2 3	8 4 2	5 4 6	7 3 5
	− 1 3 6	− 3 7 5	− 2 9	− 3 8 7	− 1 7 5	− 2 6 8	− 7 9	− 5 6 9
7.	7 0 0	8 1 7	7 1 1	9 0 0	6 2 4	9 1 0	4 5 6	3 0 0
	− 2 6 8	− 4 8	− 4 3 6	− 6 7	− 3 5 7	− 5 7 4	− 3 9 8	− 8 3



Find answers for these problems:

8. Tom had 345 cents in his bank, and Ray had 286 cents. How many more cents did Tom have than Ray?

---

9. Tom's bank will hold 600 cents. How many more cents does he need to fill it?

---

10. If Ray's bank will hold 475 cents, how many more will he need to fill it?

---

11. How many fewer cents will Ray's bank hold than Tom's?

Subtracting 4-Place and 5-Place Numbers

1. In box A, we must borrow to get more hundreds. Finish the work.

2. In box B, you must borrow 3 times. Write all your work in box B.

It is quicker to *think* the changes. Cover your borrowing figures in box B and finish the following:

6 from 6 = ------

8 from 10 = ------

5 from 12 = ------

7 from ------ = 2

1 from ------ = 6

The remainder is ----------.

A

$$\begin{array}{r} {\scriptstyle 5}\ {\scriptstyle (13)} \\ 6,359 \\ -\ 2,914 \\ \hline \end{array}$$

B

$$\begin{array}{r} 80,306 \\ -\ 17,586 \\ \hline \end{array}$$

Try to subtract in rows 3 to 7 by just thinking the changes.

	a	b	c
3.	7,246 − 4,836	9,031 − 4,782	8,506 − 3,874
4.	40,705 − 26,918	91,342 − 3,687	70,095 − 18,796
5.	9,157 − 5,469	8,000 − 4,127	7,413 − 4,628
6.	62,079 − 4,889	50,704 − 13,768	82,400 − 76,731
7.	54,120 − 8,740	90,500 − 86,459	60,004 − 15,844

Numbers at the Flower Show

[*Subtraction problems*]



The poster in the picture shows the attendance at the spring flower show.

1. How many more people attended the flower show on Sunday than on Saturday?

----

2. How many fewer people attended on Wednesday than on Saturday?

----

3. How many more people attended on Tuesday than on Monday?

----

4. Tuesday's attendance was how much greater than Wednesday's?

Working with Money Numbers

[*Checking remainders*]

Work and check rows 1 to 3. To check, add the remainder to the number subtracted. The sum of these should equal the number you subtracted from.

	a	b	c	d	e	f	g
1.	832 −159	$8.03 −7.56	$7.00 −0.98	507 −439	5,106 −2,749	$90.00 −84.32	$702.09 −456.79
2.	790 −752	450 −197	$8.14 −3.68	426 −178	4,000 −3,896	$61.15 −14.27	$910.60 −87.43
3.	743 −278	$5.17 −0.94	$9.34 −2.56	$8.00 −7.94	7,053 −6,567	$87.56 −49.78	$720.00 −242.53

Problems in Subtracting Money Numbers

Find answers for problems 1 to 5 and write them on the lines. Do your work in the space under the picture.

1. Alan has saved $37.50. How much more does he need to buy the bicycle shown in the picture?

---

2. Nancy spent $4.58 of her $5 bill for skates. How much did she have left?

---

3. Fred's new skates cost $5.20. What was the difference in the cost of Fred's and Nancy's skates?

---

4. Last summer Lee earned $29.25. He spent $11.86 and saved the rest. How much did he save?

---

5. One raincoat costs $8.95; another costs $12.50. The difference is _____.



Can You Make Change as a Clerk Does?



When you shop, do you count your change to see that the clerk has given you the correct amount?

When clerks make change, they try to use the smallest number of coins possible. They give **first** the coin that is worth the **least**.

	Cost	Cents	Nickels	Dimes	Quarters	Half Dollars	Dollars
1.	$2.17	3	1		1	1	2
2.							
3.							
4.							
5.							

For problems 2 to 5, first write, in the box above, the cost of each article. (Use the picture.) Then write the number of coins and bills you should get in change. Ex. 1 is done for you.

1. David bought a lunch box and gave the clerk $5.
2. Ann gave the clerk $1 to pay for a pencil case.
3. Janet gave a $5 bill to pay for a school bag.
4. Helen paid for a notebook with a $1 bill.
5. Carol bought a handbag and gave the clerk $2.

For problems 6 to 10, write the answers on the lines after the problems.

6. Bill bought a tennis racket and received $2.65 in change. What amount did he give the clerk?

---

7. After Grace bought roller skates and a notebook, she had $1.75 left. How much did she have at first?

---

8. Pat bought a model airplane and gave the clerk three $1 bills. What amount of change did he get?

---

9. What is the difference in the cost of a dart game and a model airplane?

---

10. What is your change from $5 if you buy a dart game?

Can You Find n, the Missing Addend?

1. In box A, 15 is the sum of 8 and another number (*n*).

To find *n*, we subtract 8 from 15.

n = _____

2. In box B, 97 is the sum of two addends. One addend is 69.

To find *n*, the missing addend, we subtract _____ from _____. *n* = _____.

When we know the sum of two addends and we know one of the addends, we subtract to find the other addend.

A

$8 + n = 15$

$15 - 8 =$ ____

B

$69 + n = 97$

$$\begin{array}{r} 97 \\ -\,69 \\ \hline \end{array}$$

Find *n* in Ex. 3 to 11. Do Ex. 3 to 6 in your head. Work Ex. 7 to 11 on another sheet of paper and write just the answers.

3. $n + 86 = 94$ n = _____

4. $35 + n = 82$ n = _____

5. $n + 27 = 60$ n = _____

6. $14 + n = 72$ n = _____

7. $\$4.20 = n + \$1.48$ n = _____

8. $\$6.00 = n + \$1.56$ n = _____

9. $\$3.04 = n + \$1.75$ n = _____

10. $\$9.11 = n + \$8.64$ n = _____

11. $\$8.83 = n + \$2.45$ n = _____

Can You Find n, the Missing Minuend?

1. In box A, 6 is the number left when 8 is subtracted from a larger number (*n*).

To find *n*, we add ___ and ____. *n* = _____.

2. In box B, 24 is the remainder when 48 is subtracted from the missing minuend (*n*).

To find *n*, we add 24 and ____. *n* = ____.

When we know the number subtracted and we know the remainder, we add to find the missing minuend.

A

$n - 8 = 6$

$6 + 8 =$ _____

B

$n - 48 = 24$

$$\begin{array}{r} 24 \\ +\,48 \\ \hline \end{array}$$

Find *n* in Ex. 3 to 10. Do Ex. 3 to 6 in your head. Work Ex. 7 to 10 on another sheet of paper and write just the answers.

3. $n - 75 = 49$ n = _____

4. $n - 67 = 84$ n = _____

5. $90 = n - 37$ n = _____

6. $47 = n - 86$ n = _____

7. $n - \$3.75 = \$8.96$ n = _____

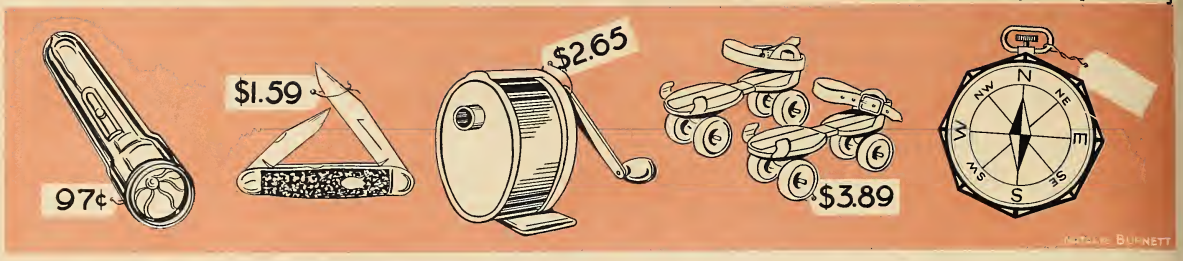
8. $n - \$4.83 = \$5.18$ n = _____

9. $\$6.75 = n - \$8.45$ n = _____

10. $\$3.09 = n - \$7.68$ n = _____

Problems to Work

[*A. and S. of money numbers*]



Work these problems about the picture:

1. Lee has 69¢. To buy the flashlight, he needs how much more money?

---

2. How much less does the flashlight cost than the knife?

---

3. Tony bought a knife. What was his change from $2.00?

---

4. Ellen bought a pencil sharpener and gave the clerk a $5 bill. The clerk counted her change this way: "$2.65; $2.75; $3; $4; $5." What coins and bills did Ellen receive?

---

5. What amount of change did Ellen (Ex. 4) receive?

---

6. George bought two flashlights and a knife. Find the total cost of these things.

---

7. Sam had 52¢ left after he bought a pair of skates and a knife. How much money did he have at first?

---

8. Ed has two $1 bills and a half dollar in his pocket. Has he enough money to buy a flashlight and a knife?

---

9. Jack bought a knife and a compass. He paid a total of $4.54. What was the cost of the compass?

The Signs Tell You What to Do

	a	b	c	d	e	f	g
1.	867	$15.67	8,698	8,972	638	$18.46	58,973
	45	0.82	4,837	5,486	1,754	9.57	8,649
	+973	+49.36	+569	+398	+879	+32.89	+73,489
2.	801	$15.00	$40.16	702	$8.15	900	$50.00
	−528	−7.43	−21.89	−156	−7.48	−396	−14.26

Can You Round Numbers and Estimate Answers?

[*A. and S.*]

1. Peter took three trips with his family last year. On one of these trips they drove 298 miles; on another, 637 miles; and on another, 714 miles. About how many miles did they drive on all three trips?

To estimate the total, round each number to the nearest hundred. Finish the work in box A.

A

298 is about 3 hundreds ___300___

637 is about 6 hundreds _____

714 is about 7 hundreds + _____

The estimated total is: _____

2. An airplane trip of 3,750 miles is about how much longer than a trip of 1,989 miles?

In box B, round to the nearest thousand.

B

3,750 is about 4 thousands _____

1,989 is about 2 thousands − _____

The estimated difference is: _____

3. Round each number to the nearest ten:

a. 689 pounds _____

b. 513 books _____

c. 477 chairs _____

4. Round to the nearest hundred:

a. 724 boats _____

b. 486 miles _____

c. 468 cars _____

5. Round to the nearest thousand:

a. 4,896 trucks _____

b. 7,099 people _____

c. 8,275 radios _____

6. Round to the nearest dollar:

a. $416.87 _____ **d.** $529.54 _____

b. $189.15 _____ **e.** $880.48 _____

c. $605.03 _____ **f.** $24.52 _____

For each of Ex. 7–10, circle the answer that is nearest to the exact answer. Use rounded numbers to help you. Then find the exact answer.

		Exact Answers
7. 697 + 432 + 578	**1,500; 1,600; 1,700**	_____
8. $49.75 + $32.83 + $50.29	**$131; $133; $135**	_____
9. 5,896 minus 1,932	**3,000; 4,000; 5,000**	_____
10. $84.10 less $29.99	**$50; $52; $54**	_____



Vacation Trips by Automobile

[*Problems using A. and S.*]

A fifth-grade class in Detroit made a map of the United States and located on it the cities some of the children visited during their summer vacation.

The table below gives the distances by automobile from Detroit to these cities.

To	Miles	To	Miles
Boston	818	New Orleans	1,091
Chicago	269	New York	652
Cleveland	170	Omaha	743
Dallas	1,184	St. Louis	517
Denver	1,288	Seattle	2,389
Los Angeles	2,366	Washington, D.C.	514

1. Max visited his uncle in Omaha. The round trip was how many miles?

---

2. Betty went to Seattle, and Jane to Denver. How much farther from Detroit is Seattle than Denver?

---

3. Ken went to Boston and back during July. In August he went to Chicago and home again. How many miles did he travel on both trips?

---

4. The round trip from Detroit to Los Angeles is how many miles?

---

5. George and his family started for Dallas. They drove 326 miles the first day. Then they had how many miles to go?

---

6. How much closer to Detroit is Cleveland than St. Louis?

---

7. Jeff flew to Washington, D.C., a distance of 396 miles by air, and drove back to Detroit with his uncle. How long was his whole trip?

---

8. In going to New Orleans, Gail's family drove 389 miles Monday and 456 miles Tuesday. That was how many miles in all?

---

9. How many miles farther did Gail's family (Ex. 8) have to travel?

---

2 Multiplication Is Shorter than Addition



To find how many candles in all, we can count by 1's or by 7's; or we can add $7 + 7 + 7 + 7$. The quickest way is to use the multiplication fact $4 \times 7 = 28$.

When we know an easy fact, sometimes we can use doubling to help with a hard fact. We can think, "Two 7's = 14, so four 7's = 14 + 14, or 28." Since four 7's = 28, eight 7's = 28 + 28, or 56.

1. Use a helper for the following:

a. Two 9's = _____, so four 9's = _____.

b. Four 5's = _____, so eight 5's = _____.

c. Three 4's = _____, so six 4's = _____.

d. Two 8's = _____, so four 8's = _____.

e. Three 6's = _____, so six 6's = _____.

Study a fact and its reverse together. Write products for Ex. 2 to 6.

2. Six 8's = _____ Eight 6's = _____

3. $7 \times 9 =$ _____ $9 \times 7 =$ _____

4. $8 \times 7 =$ _____ $7 \times 8 =$ _____

5. Five 6's = _____ Six 5's = _____

6. $5 \times 7 =$ _____ $7 \times 5 =$ _____

Write the products. Beside each fact, write the reverse with its product.

7. $7 \times 6 =$ _____ _____

8. $9 \times 3 =$ _____ _____

9. $9 \times 8 =$ _____ _____

10. $7 \times 3 =$ _____ _____

11. $9 \times 6 =$ _____ _____

12. $2 \times 6 =$ _____ _____

13. $6 \times 3 =$ _____ _____

14. $5 \times 4 =$ _____ _____

15. $5 \times 3 =$ _____ _____

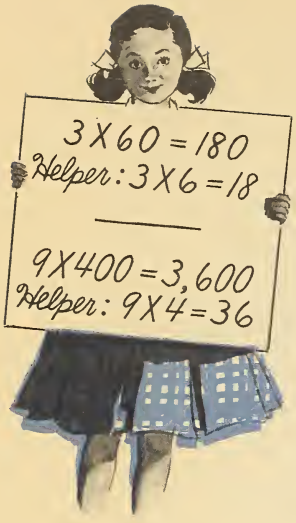
16. $7 \times 4 =$ _____ _____

17. $9 \times 5 =$ _____ _____

Write products for rows 18 to 21.

	a	b
18.	$7 \times 7 =$ _____	$3 \times 0 =$ _____
19.	$8 \times 8 =$ _____	$1 \times 6 =$ _____
20.	$0 \times 6 =$ _____	$9 \times 9 =$ _____
21.	$7 \times 1 =$ _____	$5 \times 5 =$ _____

Making Multiplication Tables for Tens, Hundreds, and Thousands



1. Study the work on Jane's card in the picture. Then finish the tables started in columns **a** to **c**.

a	**b**	**c**
$4 \times 60 = 240$	$9 \times 800 = 7{,}200$	$4 \times 7{,}000 = 28{,}000$
$5 \times 60 =$ _____	$8 \times 800 =$ _____	$5 \times 7{,}000 =$ _____
$6 \times 60 =$ _____	$7 \times 800 =$ _____	$6 \times 7{,}000 =$ _____
$7 \times 60 =$ _____	$6 \times 800 =$ _____	$7 \times 7{,}000 =$ _____
$8 \times 60 =$ _____	$5 \times 800 =$ _____	$8 \times 7{,}000 =$ _____
$9 \times 60 =$ _____	$4 \times 800 =$ _____	$9 \times 7{,}000 =$ _____

We multiply tens, hundreds, and thousands just as we multiply ones.

Write the products for Ex. 2 to 9. After each, write a helper.

2. $7 \times 50 =$ _____ _____

3. $6 \times 500 =$ _____ _____

4. $9 \times 400 =$ _____ _____

5. $8 \times 30 =$ _____ _____

6. $8 \times 5{,}000 =$ _____ _____

7. $9 \times 90 =$ _____ _____

8. $7 \times 400 =$ _____ _____

9. $9 \times 20 =$ _____ _____

Problems about Hobbies

[*Using A., S., or M.*]

Do the work for problems 1 to 4 in your head. Write just your answers.

1. Ed's hobby is collecting match folders. He has 3 boxes with 80 in each box. How many has he in all?

_____

2. Tom had collected 150 picture postcards. His grandmother gave him 30, and his aunt gave him 20. Then Tom had how many cards?

_____

3. Helen has 3 envelopes with 30 old coins in each one. Has she more or less than 100 coins in all?

_____

How many more or less? _____

4. Linda has 80 snapshots in one album, 60 in another album, and 30 in another. In all, Linda has how many snapshots?

_____

Carrying in Multiplication

The work beside boxes A to C tells you what to think as you multiply and carry. Study the work and write the product in each box.

Carrying Tens

1. Box A. Ones: 28; carry 2 (tens).
Tens: $20 + 2 = 22$.

A
$$\begin{array}{r} 57 \\ \times\ 4 \\ \hline \end{array}$$

Carrying Hundreds

2. Box B. Ones: 9.
Tens: 27; carry 2 (hundreds).
Hundreds: $12 + 2 = 14$.

B
$$\begin{array}{r} 493 \\ \times\ 3 \\ \hline \end{array}$$

Carrying both Tens and Hundreds

3. Box C. Ones: 30; carry 3 (tens).
Tens: $40 + 3 = 43$; carry 4 (hundreds).
Hundreds: $20 + 4 = 24$.

C
$$\begin{array}{r} 486 \\ \times\ 5 \\ \hline \end{array}$$

Carrying both Dimes and Dollars

4. In money numbers, there are two places at the right of the decimal point. Write the product in box D.

D
$$\begin{array}{r} \$6.74 \\ \times\ 4 \\ \hline \end{array}$$

Multiply. Carry when the product in any place is 10 or more.

	a	b	c	d	e	f	g	h
5.	619 × 4	470 × 8	351 × 9	456 × 7	398 × 6	859 × 8	\$7.56 × 4	\$8.32 × 5
6.	700 × 9	803 × 4	956 × 8	640 × 3	978 × 7	\$5.97 × 6	\$7.85 × 8	\$8.65 × 7
7.	209 × 6	517 × 5	379 × 7	196 × 8	841 × 5	\$7.09 × 9	\$2.46 × 3	\$9.72 × 4

Find answers for problems 8 to 11.

8. Martha put \$7.75 in the bank each month for 6 months. How much did she put in the bank in all?

---

9. Martha's aunt earns \$360 a month. How much does she earn in 6 mo.?

---

10. A man in the bank told Martha, "We figure that about 974 people use our bank every day." That would be about how many people in 5 days?

---

11. Mr. Day's gas bill was \$8.75. His telephone bill was \$5.98. What was the difference between the bills?

Can You Multiply Four-Place Numbers?

Can you carry thousands correctly? Finish writing the products in rows 1 and 2.

	a	b	c
1.	7,812 × 3 = 23,4	5,632 × 3 = 8	9,710 × 8 = 80
2.	8,007 × 5 = 035	5,008 × 7 = 56	6,090 × 9 = 0

Sometimes you must carry three times. For Ex. 3, think this way:

Ones: 24. Carry 2 (tens).

Tens: $36 + 2 = 38$.

Carry 3 (hundreds).

Hundreds: $30 + 3 = 33$.

Carry 3 (thousands).

Thousands: $6 + 3 = 9$.

Write the product.

3.

Thousands	Hundreds	Tens	Ones
1,	5	6	4
		×	6

In multiplying money numbers, don't forget the dollar sign and decimal point.

Multiply in rows 4 and 5.

4.	$58.96 × 9	$78.10 × 9	$74.08 × 6
5.	9,005 × 8	8,097 × 4	$97.45 × 9



6. Walter counted 7 picnic tables in one section of the park. At $56.89 each, how much did all 7 cost?

---

7. At $95.98 each, how much would 6 tall playground slides cost?

---

8. Find the cost of three shorter slides at $67.50 each.

---

9. How much less does a short slide cost than a tall one?

---

10. Bob wished that he had a picnic table and a tall slide in his own yard. What would they cost?

The Signs Tell You What to Do

a	b	c	d	e	f
9,645 − 1,489	4,019 − 867	$50.04 − 37.36	875 + 9,654 + 389 + 56	4,387 + 1,658 + 479 + 8,674	$37.63 + 2.49 + 0.67 + 49.54

The Boys Have a Cook-out

[*Estimating products*]



When the boys were planning their cook-out, Ted said, "We'll need 6 pounds of hamburger at 69¢ a pound. That will cost a little less than $4.20."

1. Ted estimated. He thought of 69¢ as about 70¢. $6 \times \$0.70 = \$$_____.

To find the exact cost, Ted could *think*: "Each pound costs 1¢ less than 70¢. Then 6 pounds will cost $6 \times 1¢$, or 6¢, less than the estimate, $4.20."

$\$4.20 - \$0.06 =$ _____ (exact cost).

2. The boys bought 3 bags of charcoal at 37¢ each.

To estimate the cost, we can *think*, "3 × _____ = _____."

1 bag costs 3¢ less than 40¢, so the exact cost of 3 bags will be $3 \times 3¢$, or ____¢, less than the estimate.

$\$1.20 -$ _____ = _____.

3. At Brown's Market, milk costs 23¢ a quart. The boys needed 8 quarts.

The estimated cost is _____.

The exact cost was _____¢ more than the estimate, or $\$$_____.

4. Ronny and Dave bought 5 dozen buns at 48¢ a dozen.

The estimated cost is _____.

The exact cost was _____.

5. To find an estimated product for 5×497, *think*, "5 × 5 hundreds = _____ hundreds, or _____."

6. For $6 \times 8{,}039$, *think*, "6 × 8 thousands = _____ thousands, or _____."

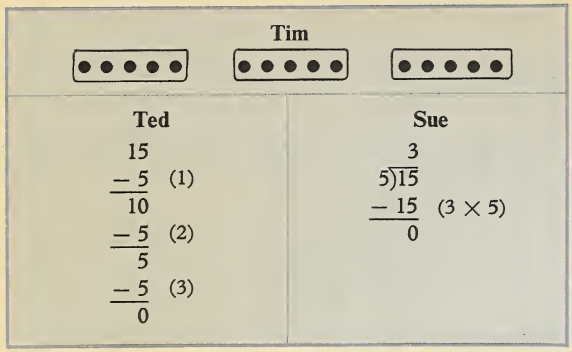
Write estimated products for rows 7 to 12.

	a	b
7.	4×87 _____	$3 \times \$0.26$ _____
8.	5×73 _____	$8 \times \$0.92$ _____
9.	9×18 _____	$6 \times \$0.49$ _____
10.	9×62 _____	7×685 _____
11.	6×24 _____	$8 \times 4{,}027$ _____
12.	5×48 _____	$6 \times 5{,}939$ _____

Using Measurement Division

1. At 5¢ each, how many oranges can Mrs. Allen buy for 15¢?

The boxes show how Tim, Ted, and Sue found the answer.



2. Tim measured off (divided) 15 dots into how many groups of 5 each?

_____

3. How many times did Ted subtract 5?

_____

4. Sue divided with numbers. She used the M. fact "three 5's are 15" to tell her how many 5's could be subtracted all at one time.

5's in 15 = _____

5. Finish this pair of division examples: $9\overline{)27}$ $3\overline{)27}$

Division facts, like multiplication facts, go in pairs.

Multiplication and division facts go together to make whole stories.

6. Finish this whole story for 7, 4, and 28:

seven 4's = _____ four 7's = _____

4's in 28 = _____ 7's in 28 = _____

Write Ex. 7–9 with the division sign ÷ and also with the division frame $\overline{)}$.

7. 5's in 45 = 9 **8.** 7's in 42 = 6

---

9. 32 divided by 8 = 4

Write quotients for Ex. 10 to 13. Under each, write the other D. fact and the two M. facts that are related to it.

10. 54 ÷ 9 = _____ **11.** 30 ÷ 6 = _____

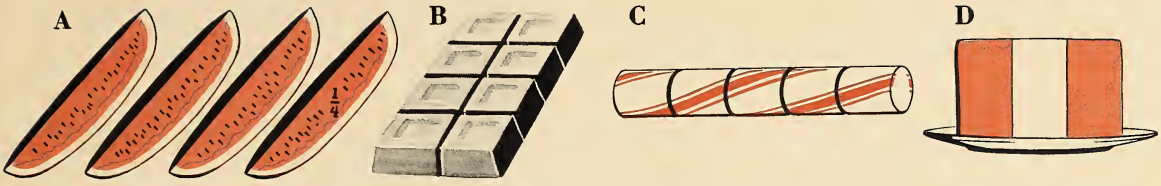
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12. 63 ÷ 7 = _____ **13.** 72 ÷ 9 = _____

Write quotients only for rows 14 to 16.

	a	b	c	d	e
14.	$5\overline{)35}$	$6\overline{)36}$	$7\overline{)0}$	$9\overline{)81}$	$6\overline{)54}$
15.	$7\overline{)49}$	$5\overline{)25}$	$8\overline{)8}$	$6\overline{)24}$	$4\overline{)16}$
16.	$4\overline{)36}$	$8\overline{)64}$	$9\overline{)0}$	$8\overline{)48}$	$8\overline{)56}$

Equal Parts of Whole Things



A	B	C	D
____ equal parts One of 4 equal parts is one fourth ($\frac{1}{4}$).	____ equal parts One of 8 equal parts is one eighth ($\frac{1}{8}$).	____ equal parts One of 5 equal parts is one fifth ($\frac{1}{5}$).	____ equal parts One of 3 equal parts is one third ($\frac{1}{3}$).

1. In boxes A to D above, fill in the blanks. What do we call numbers like $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{5}$, and $\frac{1}{3}$?

---

2. Write the correct fraction on one of the equal parts of the candy bar, on one of the equal parts of the stick of candy, and on one part of the brick of ice cream.

3. Tom's mother served 3 of the 4 equal parts of the watermelon for dinner. She served $\frac{3}{4}$ of the melon. How much was left?

---

4. What part of the candy bar will be left if you eat 3 of the 8 equal parts?

---

5. Jane gave away $\frac{2}{5}$ of her stick of candy.

She had _____ left.

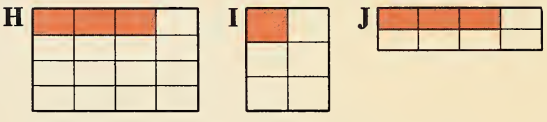
6. Under pictures F to J, write the fractions that name the red part; the white part; the sum of the two parts.



Red: $\frac{5}{6}$ -------- --------

White: $\frac{1}{6}$ -------- --------

Sum: $\frac{6}{6}$, or 1 -------- --------

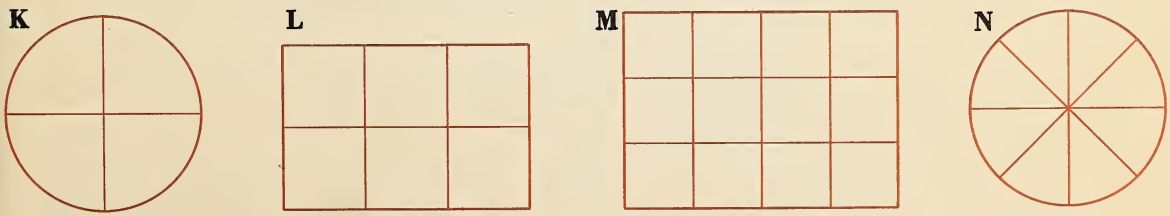


Red: -------- -------- --------

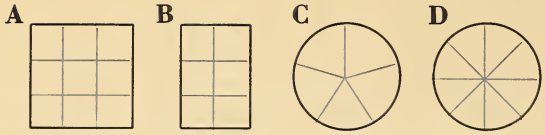
White: -------- -------- --------

Sum: -------- -------- --------

7. Color or shade $\frac{2}{4}$ of K, $\frac{4}{6}$ of L, $\frac{7}{12}$ of M, and $\frac{5}{8}$ of N.



Can You Name the Parts of a Fraction?

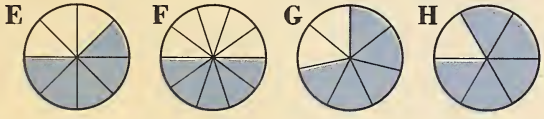


$\frac{1}{9}$ ------ ------ ------

1. Square A is measured off (divided) into ____ equal parts. It has _____ $\frac{1}{9}$'s.

2. In each of pictures A to D above, shade one of the equal parts.

3. Under each of pictures B to D, write the fraction that names one of the equal parts. Picture A has been done for you.



------ ------ ------ ------

4. Under each of circles E to H, write a fraction to name the colored part. What number did you write above the fraction line in each fraction?

The number above the fraction line is the numerator. It tells how many equal parts of the whole are in the fraction.

Each of circles E to H is divided into a different number of equal parts, so the fractions $\frac{5}{8}$, $\frac{5}{10}$, $\frac{5}{7}$, and $\frac{5}{6}$ have different numbers under the fraction line.

The number below the fraction line is the denominator. It tells how many equal parts in the whole. The fraction which names one of these equal parts also tells its size.

Use circles E to H for help with Ex. 5 to 9.

5. 8 eighths − 5 eighths = ____ eighths

6. 6 sixths − 5 sixths = ____ sixth

7. 5 tenths + 5 tenths = ____ tenths, or 1

8. $\frac{7}{7} - \frac{5}{7} = \frac{\quad}{7}$ **9.** $\frac{3}{8} + \frac{5}{8} = \frac{\quad}{8}$



------ ------

10. Under rectangles I and J, write the name of one of the equal parts.

11. Divide rectangle K into eighths in a way different from I and J.

12. In the fraction $\frac{7}{8}$, the numerator is _____; the denominator is _____.

13. Write the fraction that has 5 for the denominator and 3 for the numerator.

------

14. Write the fraction that has 7 for the numerator and 16 for the denominator.

See if you can finish Ex. 15 to 18.

15. $\frac{12}{12} - \frac{5}{12} = \frac{\quad}{12}$ **16.** $\frac{3}{7} + \frac{4}{7} = \frac{\quad}{7}$

17. $\frac{4}{4} - \frac{1}{4} = \frac{\quad}{4}$ **18.** $\frac{4}{5} + \frac{1}{5} = \frac{\quad}{5}$

Fractional Parts of Groups and of Numbers

1. If 4 girls share equally 20 cookies, each girl receives $\frac{1}{4}$ of the cookies. How many cookies does each girl receive? $\frac{1}{4}$ of $20 = ?$

$20 \div 4 =$ _____. Each girl receives _____ cookies. Write the answer in box A. Then color $\frac{1}{4}$ of the cookies.

To find $\frac{1}{4}$ of any number, divide the number by 4.

2. To find $\frac{1}{5}$ of a number, divide the number by ____.

3. To find $\frac{1}{6}$ of a number, divide the number by ____.

4. Box B. Write the answer in the box. Then color or shade $\frac{1}{3}$ of the hearts.

5. Box C. Write the answer. Color $\frac{1}{4}$ of the stars.

6. Box D. Write the answer. Color $\frac{1}{5}$ of the cherries.

7. Finish these 6 facts. Use box A to help you.

a. four 5's = _____

b. five 4's = _____

c. $\frac{1}{4}$ of 20 = _____

d. In 20 there are _____ 5's.

e. In 20 there are _____ 4's.

f. $\frac{1}{5}$ of 20 = _____

8. Finish these 6 facts. Use box B.

a. three 8's = _____

b. eight 3's = _____

c. $\frac{1}{8}$ of 24 = _____

d. In 24 there are _____ 8's.

e. In 24 there are _____ 3's.

f. $\frac{1}{3}$ of 24 = _____

Write the answers for Ex. 9 to 12. After each example, write the division fact that you used.

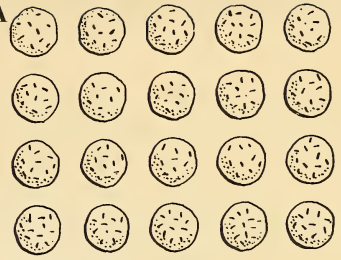
9. $\frac{1}{7}$ of 56 = ____ $56 \div 7 =$ ____

10. $\frac{1}{9}$ of 45 = ____ _____

11. $\frac{1}{6}$ of 48 = ____ _____

12. $\frac{1}{9}$ of 63 = ____ _____

A



$\frac{1}{4}$ of $20 = ?$

$20 \div 4 =$ _____

B



$\frac{1}{3}$ of $24 = ?$

$24 \div 3 =$ _____

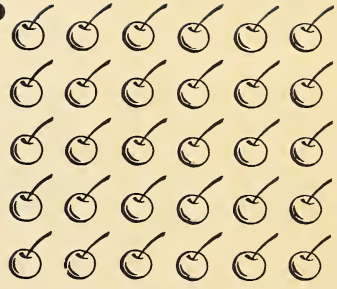
C



$\frac{1}{4}$ of $32 = ?$

$32 \div 4 =$ _____

D



$\frac{1}{5}$ of $30 = ?$

$30 \div 5 =$ _____

1. How many 7-cent popcorn balls can John buy for a quarter?

A quarter is _____ cents. We must find how many 7's in 25.

Think of the facts with the divisor 7. 7's in 21 = 3, so 7's in 25 = 3 with 4 left over. Box A shows how to write the work.

We call 21 the **table number.** The 4 that is left over is the **remainder** (R).

A

$$7\overline{)25}\quad 3,\ R4$$
$$\underline{21}\ (3 \times 7)$$
$$4\ \text{(left over)}$$

John can buy 3 popcorn balls and have 4 cents left. Draw rings around groups in the picture above to prove this.

2. How many 8-cent grapefruit can Jane buy with 50¢?

In the table of facts with divisor 8, 48 is the number just smaller than 50.

48 ÷ 8 = 6, and so 50 ÷ 8 = 6, R 2.

B

$$8\overline{)50}\quad 6,\ R2$$
$$\underline{48}\ (6 \times 8)$$
$$2$$

Write all your work for rows 3 to 5, as in Ex. 3a.

	a	b	c	d
3.	$7\overline{)30}$ 4, R2, 28, 2	$9\overline{)70}$	$8\overline{)42}$	$6\overline{)41}$
4.	$9\overline{)40}$	$8\overline{)66}$	$7\overline{)61}$	$6\overline{)23}$
5.	$8\overline{)60}$	$7\overline{)37}$	$9\overline{)53}$	$6\overline{)58}$

For rows 6 to 10, *think* the table numbers. Write only the quotients and the remainders (if any).

	a	b
6.	32 ÷ 5 = _____	45 ÷ 7 = _____
7.	68 ÷ 7 = _____	44 ÷ 6 = _____
8.	48 ÷ 6 = _____	79 ÷ 9 = _____
9.	86 ÷ 9 = _____	41 ÷ 9 = _____
10.	57 ÷ 9 = _____	49 ÷ 7 = _____

Finish problems 11 to 13 by filling in the blanks.

11. 79 chairs will make _____ rows of 8 chairs. _____ chairs will be left over.

12. Betty has 43¢ to spend for pencils at 5¢ each. She can buy _____ pencils and have _____¢ left over.

13. How many booklets can Joe make from 36 sheets of paper if he uses 8 sheets for each booklet? _____ How many sheets will be left over? _____

Can You Divide 3-Place Numbers by 1-Place Numbers?

Even Division

A

$$4\overline{)840}$$

210

Hundreds: $8 \div 4 = 2$
Tens: $4 \div 4 = 1$
Ones: $0 \div 4 = 0$

B

$$7\overline{)756}$$

108
7
56
56

Hundreds: $7 \div 7 = 1$

Tens: 5 (tens) cannot be divided by 7, so we write 0 in the quotient in ten's place. Then we divide 56 ones by 7.

Ones: $56 \div 7 = 8$

Using Uneven Division Facts

C

Step 1

$$9\overline{)618}$$

6
54 (6 tens × 9)
78

Step 2

$$9\overline{)618}$$

68, R6
54
78
72 (8 × 9)
6

Step 1. ***Getting Tens.***

The first partial dividend is 61 (tens).

Divide: For $61 \div 9$, the table number is 54. $54 \div 9 = 6$.

Multiply: 6 (tens) × 9 = 54 (tens). *Compare* to make sure this product is not larger than the number divided.

Subtract: $61 - 54 = 7$. *Compare* to make sure the remainder figure is smaller than the divisor figure, 9.

Bring down the 8 ones. The second partial dividend is 78 ones.

Step 2. ***Getting Ones.***

Divide: For $78 \div 9$, the table number is 72. $72 \div 9 = 8$.

Multiply and compare, then subtract and compare, as in Step 1. The remainder is 6.

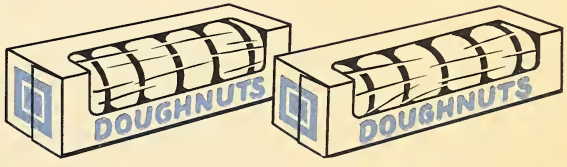
Find the quotients and the remainders (if any).

	a	b	c	d	e	f
1.	$8\overline{)856}$	$2\overline{)826}$	$6\overline{)649}$	$5\overline{)540}$	$4\overline{)484}$	$3\overline{)920}$
2.	$6\overline{)398}$	$8\overline{)589}$	$7\overline{)602}$	$5\overline{)238}$	$7\overline{)413}$	$6\overline{)478}$

3. Helen's package of paper napkins contains 120. If her family uses 8 napkins every day, how many days will the package last?

---

4. What is the cost of 6 packages of marshmallows at 35¢ a package?



5. A baker had 210 doughnuts to put into boxes with half a dozen in each box. How many boxes could he fill?

Working with 4-Place and 5-Place Dividends

A

$$
\begin{array}{r}
2{,}897 \\
3\overline{)8{,}691} \\
\underline{6} \\
26 \text{ (hundreds)} \\
\underline{24} \\
29 \text{ (tens)} \\
\underline{27} \\
21 \text{ (ones)} \\
\underline{21} \\
\end{array}
$$

B

$$
\begin{array}{r}
539 \\
9\overline{)4{,}851} \\
\underline{45} \\
35 \\
\underline{27} \\
81 \\
\underline{81} \\
\end{array}
$$

For each partial dividend, we must write a figure in the quotient.

C

$$
\begin{array}{r}
840, \text{ R3} \\
7\overline{)5{,}883} \\
\underline{56} \\
28 \\
\underline{28} \\
3
\end{array}
$$

D

$$
\begin{array}{r}
8{,}300, \text{ R6} \\
9\overline{)74{,}706} \\
\underline{72} \\
27 \\
\underline{27} \\
06
\end{array}
$$

E

$$
\begin{array}{r}
7{,}043 \\
8\overline{)56{,}344} \\
\underline{56} \\
34 \\
\underline{32} \\
24 \\
\underline{24}
\end{array}
$$

In Ex. C, D, and E, we write 0 for a quotient figure when a partial dividend will not contain the divisor. We use the zeros to keep other quotient figures in their places.

Study the work in the boxes; then divide in rows 1 and 2.

	a	b	c	d	e
1.	$3\overline{)8{,}244}$	$6\overline{)5{,}596}$	$5\overline{)9{,}682}$	$8\overline{)72{,}624}$	$9\overline{)54{,}873}$
2.	$7\overline{)6{,}654}$	$9\overline{)7{,}240}$	$8\overline{)6{,}053}$	$7\overline{)49{,}565}$	$8\overline{)43{,}207}$

Do as the signs tell you in rows 3 and 4.

3.	$3{,}078 - 1{,}498$	$7{,}506 - 897$	$6{,}700 \times 6$	$7{,}095 \times 8$	$8{,}679 \times 7$
4.	$\$65.48 \times 5$	$\$43.96 \times 9$	$7{,}968 + 789 + 3{,}726$	$\$15.67 + 0.39 + 8.67$	$7{,}000 - 1{,}954$

Dividing 4-Place and 5-Place Money Numbers

Remember: When we divide money numbers, we place the decimal point in the quotient just above the decimal point in the dividend. There are always two places at the right of the decimal point.

Find answers for problems 1 to 3 by finishing the examples at the right.

1. Seven Indian costumes cost $6.86. What was the cost of one?

---

2. A school paid $189.90 for 5 radios of the same kind. What did one radio cost?

---

3. Eight families shared equally in the cost of an outdoor fireplace and picnic table. The total cost was $160.64. How much did each family pay?

---

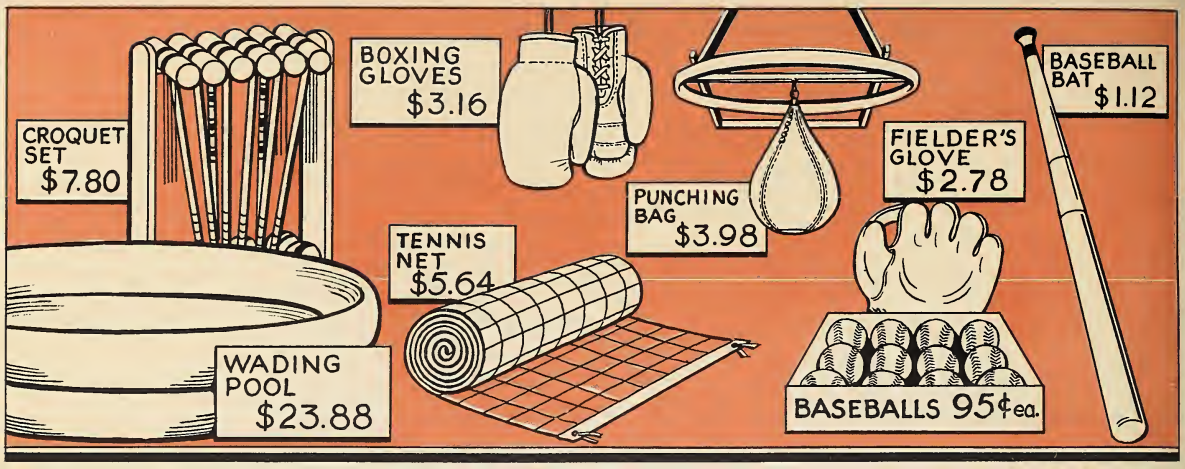
1. $7)\$6.86$ (quotient: $\$\ .$)

2. $5)\$189.90$ (quotient: $\$\ .$)

3. $8)\$160.64$ (quotient: $\$\ .$) Check Ex. 3.

Divide in rows 4 and 5.

	a	b	c	d	e
4.	$9)\$7.56$	$7)\$43.38$	$8)\$38.40$	$9)5,472$	$6)\$258.50$
5.	$7)\$5.32$	$7)\$35.56$	$5)\$187.95$	$4)17,224$	$6)\$588.20$



Sharing the Cost of Sports Equipment

[*Estimating quotients*]

Ted said, "If we six boys share equally the cost of a wading pool, we'll each have to pay about $4."

1. To estimate, Ted thought, "$23.88 is about $24. $\frac{1}{6}$ of $24 = $ _____."

2. $\frac{1}{6}$ of $23.88 = _____. This is _____ less than the estimate.

3. Four girls decided to share equally the cost of the croquet set shown in the picture. About how much would each girl's share be?

_____

4. Each girl's share would be exactly how much?

_____

5. Five boys plan to buy a fielder's glove, a bat, and a baseball. What is the total cost of these things?

_____

6. If the five boys share equally the cost of the things in Ex. 5, about how much will each pay?

_____

7. Exactly how much would each of the boys in Ex. 6 have to pay?

_____

8. What is the cost of a punching bag and boxing gloves?

_____

Circle the best estimates in Ex. 9–11.

9. If Sam, Joe, and Ray each pay the same amount toward the cost of a punching bag and boxing gloves, will each share be nearer to $2 or to $3?

10. If Sharon and Ruth share equally the cost of a tennis net, will each one's share be nearer to $2 or to $3?

11. Will $\frac{1}{4}$ of $15.92 be nearer to $3 or to $4?

Write estimated quotients for these:

	a	b
12.	294 ÷ 6 _____	482 ÷ 8 _____
13.	$53.73 ÷ 9 _____	$45.44 ÷ 9 _____
14.	$\frac{1}{7}$ of $27.86 _____	$\frac{1}{8}$ of $63.92 _____

Problems with Hidden Questions

In a two-step problem there are two questions to be answered. The problem asks only one question, and the other one is *hidden*. To solve the problem, you must first find and answer the hidden question.

Work problems 1 to 6, below. Use the space in column C for your work. If you need help, read the questions in column B.



A. Two-Step Problems	B. Hidden Questions	C. Space for Work
		Step 1 / *Step 2*
1. Harry wanted an electric train which cost $45.75, but he had only $8.50. The storekeeper let Harry pay $8.50 in cash and the rest in 5 equal payments. What was the amount of each payment?	1. What amount did Harry have left to pay?	$45.75 − 8.50 = $37.25 ; 5)$37.25
2. Mike bought 8 sections of track at 39¢ each, and a station for $1.75. How much did these things cost?	2. What was the cost of 8 sections of track?	
3. Bob bought a tunnel for $1.59 and a signal tower for $2.37. What was his change from $5.00?	3. What was the total cost of the tunnel and the signal tower?	
4. Harry, Mike, and Bob bought some freight cars for $2.78 and a transformer for $6.79. They shared the cost equally. How much did each pay?	4. How much did the cars and the transformer cost in all?	
5. Don has saved $7.75 toward a set of tools which cost $23.75. If he can save $4 a month, how many months will it take to save enough to buy the set of tools?	5. How much more money does he need to buy the tools?	
6. Marian bought an electric clock for $7.95, and an extension cord for 69¢. What was her change from $10?	6. What was the total cost of the clock and the cord?	

A Visit to the Zoo

[Finding and using averages]



1. One Saturday, 14 boys from one Boy Scout troop, 21 from another, and 19 from another visited the zoo. What was the average number from a troop?

To find the average, we must divide the total by the number of groups. So in this problem we have a hidden question: What was the total number of boys?

14 + 21 + 19 = _____ (total)

Total ÷ 3 = _____ (average)

2. The box shows the amounts of money spent at the zoo by four boys. What was the average amount spent by a boy?

	Spent
Philip	55¢
Les	36¢
Tony	42¢
George	59¢

Here we find the total and divide by 4, because there are 4 boys.

Find the average and write it on this line: _____.

Use the space below for your work.

3. The boys arrived at the zoo at 2 P.M. and stayed until 5 P.M.

How many hours did they stay? _____

How many minutes did they stay? _____
(Remember: 1 hour = 60 minutes.)

4. The boys visited 9 places at the zoo. What was the average number of minutes they spent at a place?

Here we divide the total number of minutes (180) by 9 to find the average.

The average is _____.

5. The zoo has 48 different kinds of birds. One fourth of the kinds are from this country. How many kinds are from other countries?

_____

6. An average of 2,510 people per day visited the zoo during the first 7 days it was open. This was how many more than 10,000 people?

_____

7. During the next 7 days that the zoo was open, a total of 12,250 people visited it. What was the average number of people per day?

_____

Testing What You Have Learned

[*Cumulative Review*]

Write just the answers for Ex. 1 to 8.

1. How much larger is 275,384 than 270,384?

---

2. 4,896 = _____ thousands and _____ hundreds and _____ tens and _____ ones.

3. 100,000 − 1 = _____

4. Jean has three $5 bills, two half dollars, and three quarters. In all, she has how much money?

---

5. Write the largest 6-place number.

---

6. What fractional part of the circle is green?

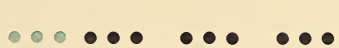


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7. What part is white?

---

8. What part of the dots below is green?



Find *n* in Ex. 9 to 19. Do the work in your head.

9. n + 8 = 15 n = _____

10. 27 − n = 9 n = _____

11. 7 + 34 = n n = _____

12. 17 = n + 5 n = _____

13. 58 − 20 = n n = _____

14. 30 − n = 24 n = _____

15. 13 + n = 39 n = _____

16. n = 18 + 11 n = _____

17. 56 − n = 8 n = _____

18. 35 = n + 15 n = _____

19. $\frac{1}{8}$ of 56 = n n = _____

How Accurate Are You?

Do as the signs tell you in rows 1 and 2.

	a	b	c	d	e
1.	9,867 4,398 +642	817 −398	47 ×9	$60.03 −9.56	895 ×6
2.	$9.08 ×7	7)595	6)5,098	$13.95 ×4	9)$365.40

How Well Can You Estimate?

For Ex. 1–9, circle the answer that is nearest to the exact answer. Use rounded numbers. Do not write in the boxes now.

1. What is the sum of 378, 596, and 217?

1,200; 1,000; 800

2. What is the difference between 8,102 and 6,979?

1,000; 2,000; 3,000

3. What is the product of $8 \times \$4.89$?

\$28; \$32; \$40

4. $7 \times \$89.50 = ?$

\$720; \$630; \$560

5. $\frac{1}{8}$ of $\$79.60 = ?$

\$9; \$10; \$11

6. Jean's canary cost \$10.95, and the cage cost \$8.79. How much did both cost?

\$18; \$19; \$20

7. How much more did Jean's canary cost than the cage?

\$2.00; \$3.00; \$3.50

8. Carl wants a parakeet. He has saved \$1.85 a week for 6 weeks. How much has he saved?

\$6; \$12; \$18

9. If 4 children share equally the cost of a \$7.80 parakeet, what is each child's share?

\$1.50; \$2.00; \$2.50

Now find exact answers for Ex. 1–9. Write your answers in the boxes.

Can You Write the Missing Words or Signs?

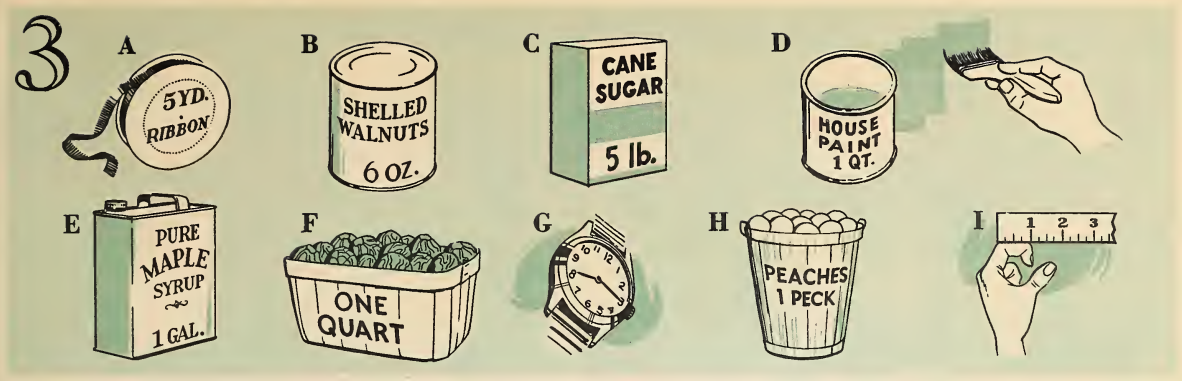
For each of Ex. 1 to 8, fill in the correct word or words. Use one of the followir

plus; minus; times; divided by; of

1. 4 _____ 17 = 68
2. 56 _____ 19 = 37
3. 45 _____ 36 = 81
4. $\frac{1}{8}$ _____ 152 = 19
5. 42 _____ 6 = 252
6. 288 _____ 8 = 36
7. 96 _____ 58 = 154
8. 115 _____ 18 = 97

For Ex. 9 to 17, fill in one of the following signs: + − × ÷

9. 5 ____ 80 = 400
10. 218 ____ 28 = 246
11. 184 ____ 8 = 23
12. 205 ____ 96 = 109
13. 54 ____ 8 = 432
14. 80 ____ 5 = 16
15. 300 ____ 86 = 214
16. 315 ____ 7 = 45
17. 257 ____ 85 = 342



Units of Measure

Which of the pictures above show the use of a measure of

1. length? _____ 2. liquids? _____

3. weight? _____ 4. time? _____

5. dry materials? _____

Write the name of a **unit of measure** we can use to tell the amount of each of the following:

6. Cereal in a box *ounce* _____

7. Milk for a pudding _____

8. Gasoline in a tank _____

9. Flour in a bag _____

10. Cloth for a dress _____

11. Coal in a bin _____

12. Ice cream for a party _____

13. Time for a trip _____

14. Apples in a basket _____

15. String in a ball _____

Finish Ex. 16–23. If you need help, use the tables near the end of your textbook.

16. 12 inches (in.) = ____ foot (ft.)

17. 2 pounds (lb.) = _____ ounces (oz.)

18. 2 dozen (doz.) = _____ things

19. 4 gallons (gal.) = _____ quarts (qt.)

20. 4 cups = _____ pints (pt.)

21. 2 yards (yd.) = _____ inches

22. 12 feet = _____ yards

23. $\frac{1}{2}$ pound = _____ ounces

24. Jay and Ben are going fishing at a lake 3 miles from their home. The boys can walk a mile in 15 minutes. How long will it take them to walk to the lake?

_____

25. If Jay and Ben start for the lake at the time shown here, at what time should they get there?



_____

At a Roadside Market

[2-step problems]



1. What unit of measure is used in selling corn in this market? _____

in selling beets and radishes? _____

2. To make 25 bunches of 7 beets each, how many beets are needed? _____

3. Will the farmer get more or less than $3.00 for 25 bunches of beets? _____

How much more or less? _____

4. A bushel of grapes weighs 48 lb., so a peck would weigh _____ lb.

5. What is the weight of 6 bu. of apples if they weigh 50 lb. a bushel?

_____

6. John's mother bought 2 doz. ears of corn and a bushel of tomatoes. What was her change from $5?

_____

7. A customer bought 2 doz. eggs and 2 bunches of radishes. In making change, the clerk used a cent, a nickel, and a half dollar. How much money had the customer given the clerk?

_____

8. At 55¢ a quart, how much would a gallon of honey cost?

_____

9. Fill in the blanks below. Use the prices given in the picture.

a. Fred's mother bought:	**b.** Sue's mother bought:	**c.** Carl's father bought:
1 bu. apples _____	1 pk. grapes _____	2 bu. apples _____
2 lb. beans _____	3 doz. ears of corn _____	2 doz. eggs _____
1 qt. honey _____	1 doz. eggs _____	1 pk. grapes _____
Total cost _____	Total cost _____	Total cost _____
Gave clerk $3.00	Gave clerk $5.00	Gave clerk $10.00
Change is _____	Change is _____	Change is _____

Working with Two-Place Multipliers

1.
$$\begin{array}{r} 52 \\ \times\ 10 \\ \hline 520 \end{array}$$

2.
$$\begin{array}{r} 87 \\ \times\ 40 \\ \hline 3{,}480 \end{array}$$

3.
$$\begin{array}{r} 70 \\ \times\ 50 \\ \hline 3{,}500 \end{array}$$

1. 1 ten × 52 = 52 tens, or _____.

2. 4 tens × 87 = 348 tens, or _____.

3. 5 tens × 70 = 350 tens, or _____.

You multiply by even tens just as you multiply by ones, and write 0 in one's place in the product to show that the product means tens.

4.
$$\begin{array}{r} 24 \quad \textit{multiplicand} \\ \times\ 32 \quad \textit{multiplier} \\ \hline 48 \quad (2 \times 24) \\ 720 \quad (30 \times 24) \\ \hline 768 \end{array}$$

5.
$$\begin{array}{r} 97 \\ \times\ 86 \\ \hline \\ \\ \hline \end{array}$$

(6 × 97) — *first partial product*

(80 × 97) — *second partial product*

whole product

Study Ex. 4. Then finish Ex. 5.

To multiply by a 2-place number, multiply by the ones, then by the tens, and then add the partial products.

Find the products for rows 6 and 7.

	a	b	c	d	e	f	g
6.	89 × 10	64 × 10	43 × 70	90 × 40	38 × 90	50 × 60	55 × 40
7.	34 × 28	75 × 39	87 × 58	79 × 47	26 × 69	95 × 48	89 × 76

Find answers for problems 8 to 11.

8. One package of lunch bags contains 48 bags. In 10 packages, there are how many bags?

---

9. A movie house has 50 rows of seats, with 28 seats in each row. How many seats are there in all?

---

10. Betty picked a bouquet of 18 daisies. For 10 bouquets of the same size, how many daisies would she have to pick?

---

11. If the supply room allowed 32 rulers for each classroom, how many rulers would be needed for 26 rooms?



1. Last year the Camera Club had a snapshot show. Each of the 26 members brought 18 of his favorite snapshots. How many snapshots were shown in all?

Study the multiplication in the box. Notice that we do not need to write a zero in one's place in the second partial product. The 36 means **36 tens, or 360,** because of the place in which each figure is written. Finish the work in the box.

$$\begin{array}{r} 18 \\ \times\ 26 \\ \hline 108 \\ 36 \\ \hline \end{array}$$

Multiply in rows 2 to 4. Use the short way that is explained above.

Remember that in money numbers there should always be two places at the right of the decimal point.

	a	b	c
2.	$\begin{array}{r} 57 \\ \times\ 48 \\ \hline \end{array}$	$\begin{array}{r} 84 \\ \times\ 36 \\ \hline \end{array}$	$\begin{array}{r} \$0.18 \\ \times\ 69 \\ \hline \end{array}$
3.	$\begin{array}{r} 95 \\ \times\ 46 \\ \hline \end{array}$	$\begin{array}{r} 38 \\ \times\ 75 \\ \hline \end{array}$	$\begin{array}{r} \$0.73 \\ \times\ 54 \\ \hline \end{array}$
4.	$\begin{array}{r} 69 \\ \times\ 74 \\ \hline \end{array}$	$\begin{array}{r} 56 \\ \times\ 92 \\ \hline \end{array}$	$\begin{array}{r} \$0.89 \\ \times\ 37 \\ \hline \end{array}$

Find answers for these problems about the Camera Club. Be careful—these are not all multiplication problems.

5. Bob joined the Camera Club and bought the camera shown in the picture at the left above. How much change did he receive from $10.00?

---

6. Bill wants a flash gun like the one in the picture, but he has only $2.85. How much more must he save?

---

7. Fifteen members of the Camera Club bought snapshot albums like the one in the picture. How much did the 15 cost?

---

8. During the year, Janet's father bought 12 rolls of black-and-white film at 65¢ each and 3 rolls of color film at $2.45 each. How much did he spend for film?

Three-Place and Four-Place Multiplicands

Read each problem. Then finish the work in boxes A, B, and C to find the answers. Notice that the right-hand figure of each partial product is written in the same column as the figure we multiply by.

1. A school bought 28 shrubs for a hedge at $2.69 each. How much did the 28 shrubs cost?

---

2. Twenty-six rooms in the school needed bookcases. At $30.70 each, how much would 26 bookcases cost?

---

3. The round trip by train between two cities is 4,836 miles. How far does the train travel in 75 round trips?

A

$2.69
× 28
2152
538

B

$30.70
× 26
18420
6140

C

4,836
× 75
24180
33852

Find products for rows 4 to 7.

	a	b	c
4.	798 × 54	904 × 60	6,008 × 57
5.	657 × 93	7,896 × 53	9,205 × 39
6.	635 × 76	800 × 64	8,743 × 79
7.	540 × 83	6,040 × 89	4,287 × 47

Find answers for problems 8 to 11. First decide what to do to solve each problem. Then work in the space below.

8. Jeff's father sold a load of apples for $78.90 and a load of pears for $124.30. How much less did he get for the apples than for the pears?

---

9. How much will 85 dozen eggs at 69¢ a dozen sell for?

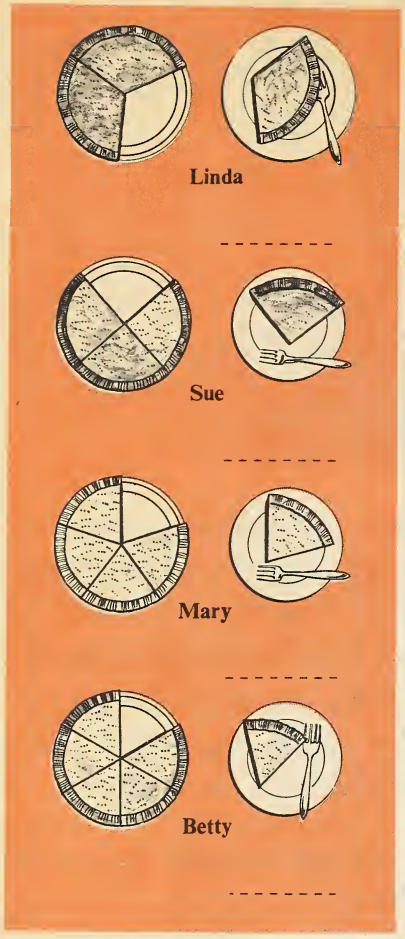
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10. Jeff's father sold 56 bushels of peaches at $3.75 a bushel. How much did he get for them?

---

11. Rita paid $3.54 for 6 quarts of strawberries. How much did the strawberries cost per quart?

Equal Parts of a Whole



1. The pies the girls baked in cooking class are all the same size. Did all the girls cut their pies into pieces of the same size?

---

2. Under each picture, write a fraction to name the part of the pie that has been taken out.

The fraction which names one of the equal parts of each pie is the **fractional unit** for that pie.

3. Write the fractional unit for

a. Linda's pie ____ **c.** Mary's pie ____

b. Sue's pie ____ **d.** Betty's pie ____

4. Which of the girls cut her pie into the most parts? ____ the fewest parts? ____

5. Which girl's pie has the largest-sized parts? ____ the smallest-sized parts? ____

6. What fraction tells the name of two pieces of Linda's pie? ____ of Sue's pie? ____ of Mary's pie? ____ of Betty's pie? ____

7. Write the fractional unit for

a. Ted's bar of chocolate ____ **b.** Don's jelly roll ____

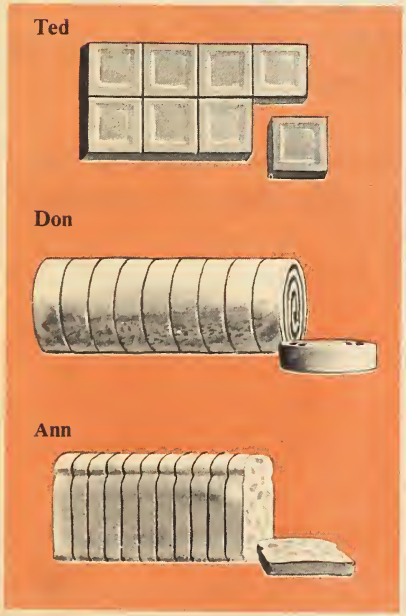
c. Ann's loaf of nut bread ____

8. Finish Ex. **a** and **b.** Then try Ex. **c** and **d.**

a. 3 thirds − 1 third = ____ thirds

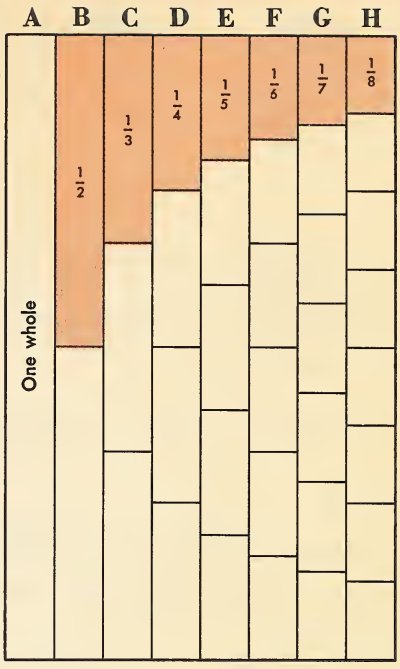
b. 5 fifths − 1 fifth = ____ fifths

c. $\frac{8}{8} - \frac{1}{8} = \frac{\quad}{8}$ **d.** $\frac{10}{10} - \frac{1}{10} = \frac{\quad}{10}$



Comparing Unlike-Fractions

In the chart at the right, study the equal parts in each bar. Use the chart for help with Ex. 1 to 7.



1. Which is longer, $\frac{1}{3}$ or $\frac{1}{4}$ of a bar? _____

2. Which is shorter, $\frac{1}{8}$ or $\frac{1}{6}$ of a bar? _____

3. Which is longer, $\frac{1}{5}$ or $\frac{1}{4}$ of a bar? _____

4. Which is shorter, $\frac{1}{6}$ or $\frac{1}{3}$ of a bar? _____

5. Copy the following parts of a bar in order of size from largest to smallest: $\frac{1}{8}$, $\frac{1}{3}$, $\frac{1}{5}$, $\frac{1}{4}$, $\frac{1}{2}$.

_____

6. Which is longer, $\frac{3}{5}$ or $\frac{3}{8}$ of a bar? _____

7. Which is shorter, $\frac{3}{7}$ or $\frac{3}{5}$ of a bar? _____

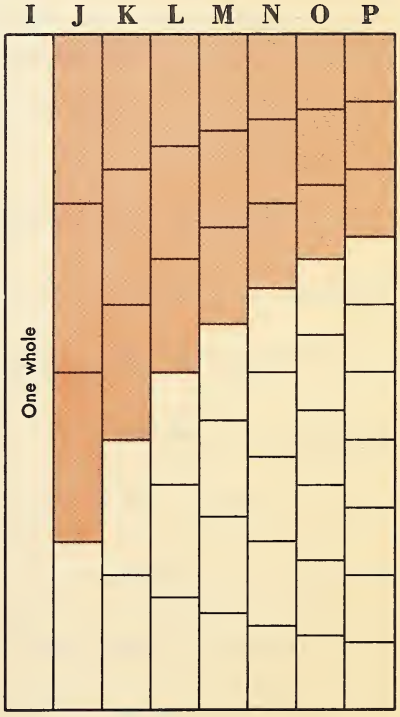
The more equal parts into which a whole is divided, the smaller each equal part will be.

8. Write the fractional unit for

bar L _____ bar N _____ bar O _____ bar P _____

9. Write a fraction to name the white part of bar K _____

of bar M _____ of bar O _____



Finish Ex. 10 to 12. Then try Ex. 13 to 16.

10. 7 sevenths − 3 sevenths = _____ sevenths

11. 9 ninths − 6 ninths = _____ ninths

12. 10 tenths − 3 tenths = _____ tenths

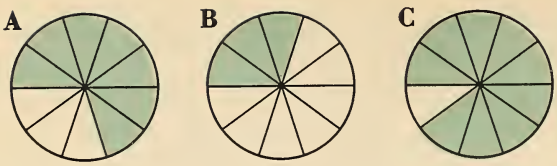
13. $\frac{10}{10} - \frac{7}{10} = \frac{\quad}{10}$

14. $\frac{5}{5} - \frac{3}{5} = \frac{\quad}{5}$

15. $\frac{8}{8} - \frac{5}{8} = \frac{\quad}{8}$

16. $\frac{7}{7} - \frac{4}{7} = \frac{\quad}{7}$

Working with Like-Fractions



--- --- ---

1. Circles A to C are the same size. Under each one, write a fraction to name the colored part.

2. Which fraction is the largest, $\frac{7}{10}$, $\frac{3}{10}$, or $\frac{9}{10}$? ---

These fractions are called **like-fractions.** They all have the same number for the denominator.

The fractions $\frac{3}{10}$, $\frac{7}{10}$, and $\frac{9}{10}$ all have the same-sized unit parts ($\frac{1}{10}$'s). We say that they have the same **fractional unit.**

$\frac{3}{5}$, $\frac{3}{8}$, $\frac{3}{10}$, and $\frac{3}{16}$ are **unlike-fractions.** Their denominators are different. These fractions have different fractional units.

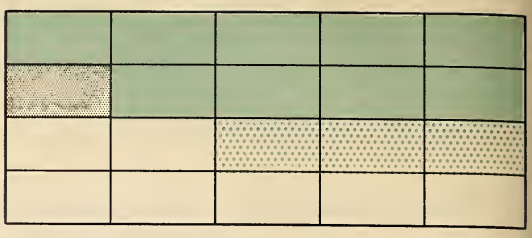
Use circles A, B, and C above to help you with Ex. 3 to 6.

3. 7 tenths is how much larger than 3 tenths? 4 tenths. $\frac{7}{10} - \frac{3}{10} =$ ---

4. 3 tenths is how much smaller than 9 tenths? ____ tenths. $\frac{9}{10} - \frac{3}{10} =$ ---

5. 9 tenths is how much larger than 7 tenths? ____ tenths. $\frac{9}{10} - \frac{7}{10} =$ ---

6. 1 tenth is how much smaller than 7 tenths? ____ tenths. $\frac{7}{10} - \frac{1}{10} =$ ---



7. What fractional part of rectangle D is solid green? ---- What part is dotted? ---- gray? ---- white? ----

8. Which is the largest fraction, $\frac{7}{20}$, $\frac{3}{20}$, or $\frac{9}{20}$? ---

9. Are the fractions $\frac{7}{20}$, $\frac{3}{20}$, and $\frac{9}{20}$ like or unlike? ---

In rectangle D,

10. $\frac{9}{20} + \frac{1}{20} = \frac{\quad}{20}$ **11.** $\frac{7}{20} + \frac{3}{20} = \frac{\quad}{20}$

12. $\frac{20}{20} - \frac{9}{20} = \frac{\quad}{20}$ **13.** $\frac{20}{20} - \frac{3}{20} = \frac{\quad}{20}$

14. $\frac{3}{20} + \frac{1}{20} = \frac{\quad}{20}$ **15.** $\frac{7}{20} - \frac{3}{20} = \frac{\quad}{20}$

16. Ned's mother cut a pie into 6 equal pieces. She served 5 pieces for dinner.

What part of the pie did she serve for dinner? ---- What part of the pie was left? ----

17. Jean's aunt cut a melon into 8 equal pieces. After dinner, only 3 pieces were left.

What part of the melon was left? ----

What part was eaten for dinner? ----

Working with Fractional Parts of Groups

A



$15 \div 5 =$ _____. $\frac{1}{5}$ of 15 = _____. One of 5 equal parts of 15 = _____.

1. Mother bought 15 candy canes. She divided them equally among 5 children.

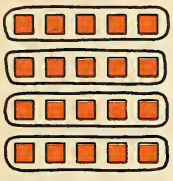
Each child received what part of all the candy canes? _____ Each child received how many candy canes? _____

2. Jane and Sue together received $\frac{2}{5}$ of 15 canes, or _____ canes (Box A).

3. Tom, Bob, and Mary together received _____ fifths of 15, or _____ canes.

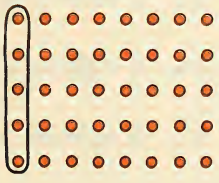
4. To find $\frac{1}{5}$ of a number, we divide by _____. To find $\frac{1}{4}$, we divide by _____.

B



One of 4 equal parts of 20 = _____

C



One of 8 equal parts of 40 = _____

Use boxes B and C if you need help with Ex. 5 to 7.

5. $\frac{1}{4}$ of 20 = _____, so $\frac{3}{4}$ of 20 = _____.

6. $\frac{1}{8}$ of 40 = _____, so $\frac{4}{8}$ of 40 = _____.

7. $\frac{1}{8}$ of 40 = _____, so $\frac{7}{8}$ of 40 = _____.

8. This carton contains



1 dozen, or _____, eggs.

a. $\frac{1}{3}$ doz. = ____, so $\frac{2}{3}$ doz. = _____.

b. $\frac{1}{6}$ doz. = ____, so $\frac{5}{6}$ doz. = _____.

c. $\frac{1}{4}$ doz. = ____, so $\frac{3}{4}$ doz. = _____.

d. $\frac{1}{12}$ doz. = ____, so $\frac{7}{12}$ doz. = _____.



9. 1 hour = _____ minutes.

How many minutes in

a. $\frac{1}{4}$ hr.? _____ $\frac{3}{4}$ hr.? _____

b. $\frac{1}{6}$ hr.? _____ $\frac{5}{6}$ hr.? _____

c. $\frac{1}{3}$ hr.? _____ $\frac{2}{3}$ hr.? _____

d. $\frac{1}{10}$ hr.? _____ $\frac{3}{10}$ hr.? _____

10. One yard = _____ inches.

a. $\frac{1}{3}$ yd. = _____ in., so $\frac{2}{3}$ yd. = _____ in.

b. $\frac{1}{4}$ yd. = _____ in., so $\frac{3}{4}$ yd. = _____ in.

c. $\frac{1}{6}$ yd. = _____ in., so $\frac{5}{6}$ yd. = _____ in.

11. $\frac{1}{7}$ of 56 = ____, so $\frac{3}{7}$ of 56 = _____.

12. $\frac{1}{9}$ of 45 = ____, so $\frac{5}{9}$ of 45 = _____.

13. $\frac{1}{8}$ of 72 = ____, so $\frac{7}{8}$ of 72 = _____.

Picturing Equal Fractions

One whole											
$\frac{1}{3}$				$\frac{1}{3}$				$\frac{1}{3}$			
$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$	
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

In the fraction chart above, look at the colored parts in each row.

1. One of the thirds is colored. How many sixths are colored? _____ How many twelfths are colored? _____

2. Are the colored parts of all three rows equal? _____ Does $\frac{2}{6} = \frac{1}{3}$? _____ Does $\frac{4}{12} = \frac{1}{3}$? _____

The chart shows that the fractions $\frac{1}{3}$, $\frac{2}{6}$, and $\frac{4}{12}$ are equal in value. We call them **equal fractions.**

Changing $\frac{2}{6}$ to the equal fraction $\frac{1}{3}$ is called changing $\frac{2}{6}$ to **lower terms.**

Changing $\frac{1}{3}$ to $\frac{2}{6}$ is called changing $\frac{1}{3}$ to **higher terms.** Changing to higher terms is really changing to a fraction with a smaller fractional unit.

3. When we change $\frac{4}{12}$ to $\frac{2}{6}$, are we changing $\frac{4}{12}$ to higher or to lower terms?

_____

Use the fraction chart above to help you finish Ex. 4 to 12.

4. 3 sixths = _____ twelfths

5. 4 sixths = 2 _____

6. 2 thirds = 8 _____

7. $\frac{2}{12} = \frac{}{6}$

8. $1 = \frac{}{6}$

9. $\frac{8}{12} = \frac{4}{}$

10. $\frac{10}{12} = \frac{}{6}$

11. $\frac{2}{3} = \frac{4}{}$

12. $1 = \frac{3}{}$

One whole															
$\frac{1}{4}$				$\frac{1}{4}$				$\frac{1}{4}$				$\frac{1}{4}$			
$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$	
$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$

13. In the chart above, the colored parts show that 1 fourth = _____ eighths, or _____ sixteenths. $\frac{1}{4} = \frac{}{8} = \frac{}{16}$.

Use the chart above to help you finish Ex. 14 to 21.

14. 2 sixteenths = 1 _____

15. 4 sixteenths = 1 _____

16. 4 eighths = 2 _____

17. 3 eighths = _____ sixteenths

18. $1 = \frac{}{8}$

19. $\frac{5}{8} = \frac{}{16}$

20. $\frac{12}{16} = \frac{3}{}$

21. $1 = \frac{16}{}$

22. If you have a measure that holds just $\frac{1}{4}$ cup, how many times must you fill it to measure

a. $\frac{1}{2}$ cup? ____ b. $\frac{3}{4}$ cup? ____

c. 1 whole cup? ____

Working with Equal Fractions

Write the missing numbers in Ex. 1 to 24. Use circles A to F if you need help.

A



1. $1 = \frac{\quad}{6}$
2. $\frac{1}{3} = \frac{\quad}{6}$
3. $\frac{2}{3} = \frac{\quad}{6}$
4. $\frac{1}{2} = \frac{\quad}{6}$

B



5. $1 = \frac{\quad}{12}$
6. $\frac{1}{4} = \frac{\quad}{12}$
7. $\frac{3}{4} = \frac{\quad}{12}$
8. $\frac{1}{2} = \frac{\quad}{12}$

C



9. $1 = \frac{\quad}{16}$
10. $\frac{1}{4} = \frac{\quad}{16}$
11. $\frac{3}{4} = \frac{\quad}{16}$
12. $\frac{1}{2} = \frac{\quad}{16}$

D



13. $1 = \frac{\quad}{10}$
14. $\frac{1}{5} = \frac{\quad}{10}$
15. $\frac{3}{5} = \frac{\quad}{10}$
16. $\frac{4}{5} = \frac{\quad}{10}$

E



17. $1 = \frac{\quad}{12}$
18. $\frac{1}{3} = \frac{\quad}{12}$
19. $\frac{2}{3} = \frac{\quad}{12}$
20. $\frac{3}{3} = \frac{\quad}{12}$

F



21. $1 = \frac{\quad}{16}$
22. $\frac{1}{8} = \frac{\quad}{16}$
23. $\frac{3}{8} = \frac{\quad}{16}$
24. $\frac{5}{8} = \frac{\quad}{16}$

Underline "Yes" or "No" for statements 25 to 34. Use circles A to F for help.

25. Two eighths = 1 fourth. (Use circle F.) Yes No
26. Three sixths = 1 half. (Use circle A.) Yes No
27. Two twelfths = 1 third. (Use circle E.) Yes No
28. One whole = 8 tenths. (Use circle D.) Yes No
29. Six twelfths = 1 half. (Use circle B.) Yes No
30. $\frac{1}{2}$ is 2 times as large as $\frac{1}{4}$. (Use circle B.) Yes No
31. $\frac{1}{2}$ is 3 times as large as $\frac{1}{6}$. (Use circle A.) Yes No
32. $\frac{1}{4}$ is 4 times as large as $\frac{1}{8}$. (Use circle F.) Yes No
33. $\frac{1}{5}$ is 2 times as large as $\frac{1}{10}$. (Use circle D.) Yes No
34. $\frac{1}{8}$ is 3 times as large as $\frac{1}{16}$. (Use circle F.) Yes No

For each of Ex. 35 to 40, draw a ring around the correct answer.

35. $\frac{1}{2}$ of $\frac{1}{4} = ?$ $\frac{1}{8}$ $\frac{2}{4}$ $\frac{1}{2}$ (Circle F)
36. $\frac{1}{2}$ of $\frac{1}{3} = ?$ $\frac{2}{6}$ $\frac{1}{6}$ $\frac{2}{3}$ (Circle A)
37. $\frac{1}{2}$ of $\frac{1}{5} = ?$ $\frac{1}{5}$ $\frac{2}{5}$ $\frac{1}{10}$ (Circle D)
38. $\frac{1}{2}$ of $\frac{1}{8} = ?$ $\frac{1}{16}$ $\frac{2}{16}$ $\frac{2}{8}$ (Circle F)
39. $\frac{1}{2}$ of $\frac{1}{2} = ?$ $\frac{2}{4}$ $\frac{1}{4}$ $\frac{1}{2}$ (Circle C)
40. $\frac{1}{3}$ of $\frac{1}{4} = ?$ $\frac{1}{12}$ $\frac{3}{12}$ $\frac{1}{6}$ (Circle B)

Using Charts to Change Fractions to Lowest Terms

Chart A

One whole															
$\frac{1}{2}$								$\frac{1}{2}$							
$\frac{1}{4}$				$\frac{1}{4}$				$\frac{1}{4}$				$\frac{1}{4}$			
$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$		$\frac{1}{8}$	
$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{16}$

In chart A, $\frac{12}{16} = \frac{6}{8}$. Of these two equal fractions, $\frac{6}{8}$ has the lower terms. But $\frac{6}{8}$ also equals $\frac{3}{4}$, which has still lower terms than $\frac{6}{8}$.

We say that fractions are in best form when they are in lowest terms.

In lowest terms, a fraction has the largest fractional unit it can have.

In rows 1 to 10, change fractions to lowest terms if they can be changed.

Use chart A for help with rows 1 to 4.

	a	b	c
1.	$\frac{6}{8} =$ _____	$\frac{4}{8} =$ _____	$\frac{2}{4} =$ _____
2.	$\frac{8}{16} =$ _____	$\frac{3}{4} =$ _____	$\frac{2}{16} =$ _____
3.	$\frac{12}{16} =$ _____	$\frac{4}{16} =$ _____	$\frac{10}{16} =$ _____
4.	$\frac{7}{8} =$ _____	$\frac{1}{2} =$ _____	$\frac{7}{16} =$ _____

Chart B

One whole											
$\frac{1}{3}$				$\frac{1}{3}$				$\frac{1}{3}$			
$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$		$\frac{1}{6}$	
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

Use chart B for help with rows 5 and 6.

5.	$\frac{2}{6} =$ _____	$\frac{4}{12} =$ _____	$\frac{5}{6} =$ _____
6.	$\frac{10}{12} =$ _____	$\frac{4}{6} =$ _____	$\frac{8}{12} =$ _____

Chart C

One whole											
$\frac{1}{2}$						$\frac{1}{2}$					
$\frac{1}{4}$			$\frac{1}{4}$			$\frac{1}{4}$			$\frac{1}{4}$		
$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$	$\frac{1}{12}$

Use chart C for help with rows 7 and 8.

	a	b	c
7.	$\frac{5}{12} =$ _____	$\frac{2}{4} =$ _____	$\frac{9}{12} =$ _____
8.	$\frac{3}{12} =$ _____	$\frac{6}{12} =$ _____	$\frac{7}{12} =$ _____

Chart D

One whole									
$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$		$\frac{1}{5}$	
$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{1}{10}$
$\frac{1}{2}$					$\frac{1}{2}$				

Use chart D for help with rows 9 and 10.

9.	$\frac{5}{10} =$ _____	$\frac{2}{10} =$ _____	$\frac{7}{10} =$ _____
10.	$\frac{8}{10} =$ _____	$\frac{6}{10} =$ _____	$\frac{9}{10} =$ _____

11. Color or shade parts of chart A to prove that $\frac{6}{16} = \frac{3}{8}$.

12. Color or shade parts of chart B to prove that $\frac{8}{12} = \frac{2}{3}$.

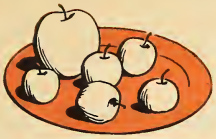
13. Color or shade parts of chart D to prove that $\frac{4}{10} = \frac{2}{5}$.

Measure line E with your ruler.

E ———————————

14. Line E is _____ inches long. It is how many $\frac{1}{4}$ inches long? _____ how many $\frac{1}{2}$ inches? _____

Can You Add and Subtract Like-Fractions?



Adding Groups of Like-Things

On the plate:	*In the circle:*
5 apples	5 eighths (orange)
+ 1 apple	+ 1 eighth (gray)
6 apples	6 eighths



Adding Like-Fractions

$\frac{5}{8}$
$+\frac{1}{8}$
$\frac{6}{8} = \frac{3}{4}$

Study the pictures and the work above. Then write the addition example shown by the orange part plus the gray part of each rectangle below. Ex. 1 is started. Find the sums and change them to best form.



1. $\frac{3}{10}$ (orange)
$+\frac{1}{10}$ (gray)



2.



3.

Add in rows 4 and 5. Change fractions in sums to best form. Use the charts on page 46 if you need help.

	a	b	c	d
4.	$\frac{1}{8}$	$\frac{1}{6}$	$\frac{1}{12}$	$\frac{5}{16}$
	$+\frac{5}{8}$	$+\frac{1}{6}$	$+\frac{5}{12}$	$+\frac{4}{16}$
5.	$\frac{1}{10}$	$\frac{7}{16}$	$\frac{3}{10}$	$\frac{2}{5}$
	$+\frac{7}{10}$	$+\frac{5}{16}$	$+\frac{2}{10}$	$+\frac{1}{5}$

Subtract in rows 6 and 7. Change fractions in remainders to best form.

	a	b	c	d
6.	$\frac{5}{8}$	$\frac{3}{10}$	$\frac{7}{12}$	$\frac{11}{12}$
	$-\frac{1}{8}$	$-\frac{1}{10}$	$-\frac{5}{12}$	$-\frac{5}{12}$
7.	$\frac{5}{6}$	$\frac{7}{10}$	$\frac{11}{12}$	$\frac{11}{16}$
	$-\frac{1}{6}$	$-\frac{3}{10}$	$-\frac{1}{12}$	$-\frac{5}{16}$

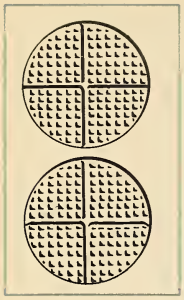
Work these fraction problems:

8. Ann used $\frac{1}{4}$ cup of lemon juice and $\frac{1}{4}$ cup of orange juice for a pudding. In all, she used _____ cup of fruit juice.

9. Bob had $\frac{7}{8}$ of a candy bar. He gave Jerry $\frac{3}{8}$ of a bar. Then Bob had left _____ of a bar.

10. One bag of popcorn weighed $\frac{7}{16}$ lb. Another bag weighed $\frac{9}{16}$ lb. Together they weighed _____ lb.

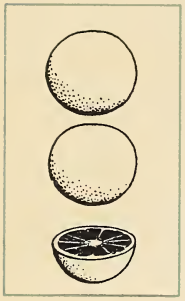
11. The first bag of popcorn weighed how much less than the second? _____



1. How many fourths in one waffle? _____

in two waffles? _____

$\frac{4}{4}$ plus $\frac{4}{4} = \frac{\quad}{4}$



2. How many halves in 1 grapefruit? _____

in 2 grapefruit? _____

in $2\frac{1}{2}$ grapefruit? _____

$\frac{2}{2} + \frac{2}{2} + \frac{1}{2} = \frac{\quad}{2}$

3. Finish the counting by thirds that is started below. Work downward.

$\frac{1}{3}$	$\frac{7}{3}$, or $2\frac{\quad}{3}$
$\frac{\quad}{3}$	$\frac{\quad}{3}$, or _____
$\frac{\quad}{3}$, or 1	$\frac{9}{3}$, or _____
$\frac{4}{3}$, or $1\frac{\quad}{3}$	$\frac{\quad}{3}$, or $3\frac{\quad}{3}$
$\frac{\quad}{3}$, or _____	$\frac{\quad}{3}$, or _____
$\frac{\quad}{3}$, or _____	$\frac{\quad}{3}$, or _____



4. Use this picture to help you find how many sixths there are in $2\frac{5}{6}$ cakes.

$\frac{6}{6} + \frac{6}{6} + \frac{5}{6} = \frac{\quad}{6}$

5. How many eighths in 1 candy bar? _____

_____ in 2 bars? _____ in $2\frac{7}{8}$ bars? _____

To change the improper fraction $\frac{8}{3}$ to a mixed number, *think*, "$\frac{3}{3} = 1$ whole, $\frac{6}{3} = 2$, so $\frac{8}{3} = 2\frac{2}{3}$."

Write the fraction that belongs after each whole number in Ex. 6 to 9.

6. $\frac{11}{8} = 1\frac{\quad}{8}$ **8.** $\frac{17}{10} = 1\frac{\quad}{\quad}$

7. $\frac{7}{6} = 1\frac{\quad}{\quad}$ **9.** $\frac{8}{5} = 1\frac{\quad}{\quad}$

In rows 10 to 13 change the improper fractions to whole numbers or mixed numbers. Use the charts on page 46 to help you change fractions to lowest terms.

	a	b	c
10.	$\frac{7}{4} =$ _____	$\frac{15}{5} =$ _____	$\frac{14}{8} =$ _____
11.	$\frac{9}{2} =$ _____	$\frac{10}{3} =$ _____	$\frac{15}{6} =$ _____
12.	$\frac{11}{5} =$ _____	$\frac{21}{8} =$ _____	$\frac{30}{10} =$ _____
13.	$\frac{17}{12} =$ _____	$\frac{25}{16} =$ _____	$\frac{24}{10} =$ _____

14. Write three proper fractions:

_____ _____ _____

15. Write three improper fractions:

_____ _____ _____

16. Write a whole number: _____

17. Write three mixed numbers:

_____ _____ _____

Picturing Improper Fractions and Mixed Numbers

1. Under picture A, write the improper fraction, then the equal mixed number, that tells the amount of watermelon.

2. In the same way, name the colored parts of pictures B to G.

3. Who bought more candy—Pam, who bought $1\frac{3}{4}$ lb., or Dot, who bought $1\frac{3}{8}$ lb.?

---

4. Stan cut a yard-long strip of leather into eighths. Lee cut a yard into sixteenths. Which boy made the shorter pieces?

---

5. Are there more cupcakes in $2\frac{5}{12}$ dozen or in $2\frac{5}{6}$ dozen?

---

6. How many pies are used when you serve $\frac{1}{6}$ of a pie to each of 9 people?

---

7. It takes Doris $\frac{1}{4}$ hr. to decorate one place card. How long will it take her to decorate 7 place cards?

---

8. Finish this counting by tenths. Work downward.

$\frac{1}{10}$	$\frac{8}{10} =$ ----	$\frac{15}{10} =$ ----
$\frac{2}{10} = \frac{\quad}{5}$	$\frac{\quad}{10}$	$\frac{\quad}{10} =$ ----
$\frac{\quad}{10}$	$\frac{\quad}{10} =$ ----	$\frac{\quad}{10} =$ ----
$\frac{\quad}{10} =$ ----	$\frac{11}{10} =$ ----	$\frac{\quad}{10} =$ ----
$\frac{\quad}{10} = \frac{\quad}{2}$	$\frac{\quad}{10} =$ ----	$\frac{\quad}{10} =$ ----
$\frac{\quad}{10} =$ ----	$\frac{\quad}{10} =$ ----	$\frac{\quad}{10} =$ ----
$\frac{\quad}{10}$	$\frac{\quad}{10} =$ ----	

A



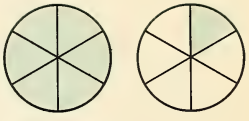
B



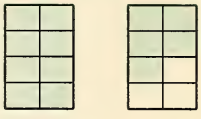
C



D



E



F



G



Adding and Subtracting Fractions

1. Betty needs $\frac{7}{8}$ yard of blue ribbon for a belt and $\frac{3}{8}$ yard for a bow. How many yards of ribbon should she buy? (Box A.)

A

$$\begin{array}{r} \frac{7}{8} \\ +\frac{3}{8} \\ \hline \frac{10}{8} = 1\frac{2}{8} \\ = 1\frac{?}{4} \end{array}$$

2. Betty's belt takes how much more ribbon than her bow? (Box B.)

B

$$\begin{array}{r} \frac{7}{8} \\ -\frac{3}{8} \\ \hline \frac{4}{8} = ? \end{array}$$

3. How long did Janet study in all if she studied $\frac{3}{4}$ hour in the morning, $\frac{1}{4}$ hour in the afternoon, and $\frac{3}{4}$ hour in the evening? (Box C.)

C

$$\begin{array}{r} \frac{3}{4} \\ \frac{1}{4} \\ +\frac{3}{4} \\ \hline \frac{7}{4} = ? \end{array}$$

Always change improper fractions in answers to whole numbers or to mixed numbers. Change proper fractions to lowest terms.

Add in rows 4 to 6.

	a	b	c
4.	$\frac{4}{5} + \frac{2}{5}$	$\frac{5}{9} + \frac{4}{9}$	$\frac{11}{12} + \frac{7}{12}$
5.	$\frac{7}{10} + \frac{3}{10}$	$\frac{3}{8} + \frac{3}{8}$	$\frac{11}{16} + \frac{9}{16}$
6.	$\frac{2}{3} + \frac{2}{3}$	$\frac{5}{16} + \frac{3}{16}$	$\frac{3}{5} + \frac{3}{5}$

Subtract in rows 7 to 9.

	a	b	c
7.	$\frac{5}{8} - \frac{1}{8}$	$\frac{9}{10} - \frac{3}{10}$	$\frac{15}{16} - \frac{3}{16}$
8.	$\frac{4}{5} - \frac{3}{5}$	$\frac{9}{16} - \frac{7}{16}$	$\frac{7}{12} - \frac{5}{12}$
9.	$\frac{13}{16} - \frac{5}{16}$	$\frac{11}{12} - \frac{1}{12}$	$\frac{9}{10} - \frac{1}{10}$

In rows 10 and 11, do what the signs tell you to do.

10.	$\frac{4}{5} + \frac{4}{5}$	$\frac{5}{8} - \frac{3}{8}$	$\frac{3}{16} + \frac{15}{16}$
11.	$\frac{11}{16} - \frac{3}{16}$	$\frac{5}{12} - \frac{1}{12}$	$\frac{11}{12} + \frac{5}{12}$

Find the sums in rows 12 to 14.

12.	$\frac{2}{3} + \frac{1}{3} + \frac{2}{3}$	$\frac{1}{10} + \frac{9}{10} + \frac{3}{10}$	$\frac{5}{12} + \frac{1}{12} + \frac{11}{12}$
13.	$\frac{3}{8} + \frac{1}{8} + \frac{5}{8}$	$\frac{9}{16} + \frac{5}{16} + \frac{13}{16}$	$\frac{1}{6} + \frac{5}{6} + \frac{1}{6}$
14.	$\frac{7}{8} + \frac{3}{8} + \frac{1}{8}$	$\frac{7}{12} + \frac{1}{12} + \frac{5}{12}$	$\frac{9}{10} + \frac{3}{10} + \frac{3}{10}$

Testing What You Have Learned

[*Cumulative Review*]

Write the missing numbers in Ex. 1 to 18.

1. 8,394 = _____ hundreds, _____ tens, and _____ ones.

2. The difference between \$243.29 and \$40.25 is _____.

3. One book weighs $\frac{3}{4}$ lb., and another book weighs $\frac{3}{8}$ lb.

The book weighing _____ lb. is heavier.

4. For 50¢, Howard can buy _____ 3¢ stamps. He will have _____¢ left.

5. In $2\frac{1}{4}$ hours there are _____ quarter hours.

6. $\frac{3}{4}$ of 24 inches = _____ inches.

7. $\frac{2}{3}$ yard = _____ inches.

8. 24 feet = _____ yards.

9. 20 quarts = _____ gallons.

10. 3 dozen = _____ things.

11. 50 yards = _____ feet.

12. 16 pints = _____ quarts.

13. 24 quarters = _____ dollars.

14. $5 \times 300 =$ _____

15. $6 \times 7{,}000 =$ _____

16. $40 \times 56 =$ _____

17. $805 \div 4 =$ _____, R _____

18. $4{,}200 \div 7 =$ _____

How Accurate Are You?

Do what the words tell you to do in rows 1 and 2.

	a	b	c	d	e	f
	Subtract	Add	Multiply	Add	Subtract	Add
1.	934 875	3,946 587	59 20	\$16.94 369.48	\$30.19 15.89	25¢ 98¢

	Divide	Multiply	Subtract	Divide	Multiply	Divide
2.	$8\overline{)756}$	639 45	\$124.02 9.57	$9\overline{)\$563.04}$	\$80.56 29	$4\overline{)295}$

How Well Can You Estimate?

[*A., S., M., and D.*]

For Ex. 1 to 11, circle the answer that is nearest to the exact answer. Use rounded numbers. Do not write in the boxes now.

1. What is the difference between 1,965 and 4,000?
2,000; 1,000; 3,000

2. $7 \times 596 = ?$
3,500; 4,200; 6,300

3. What is the sum of 8,967, 753, and 1,167?
9,000; 11,000; 12,000

4. What is the quotient of $8,073 \div 9$?
900; 90; 800

5. What is $\frac{1}{5}$ of $90.25?
$18; $16; $20

6. $398.54 is how much less than $500?
$50; $100; $200

7. At $2.98 a pair, what is the cost of 12 pairs of tennis shoes?
$12; $24; $36

8. What is the cost of 1 tennis ball if a half dozen cost $4.74?
60¢; 70¢; 80¢

9. How much do you have left if you spend $13.15 out of $20?
$10; $7; $9

10. A gift cost $15.60. Eight people shared the cost equally. How much did each one pay?
$3; $2.50; $2

11. One week Hal earned $5.80, and Bob earned three times as much. How much did both boys earn together?
$20; $24; $30

Now find exact answers for Ex. 1 to 11. Write your answers in the boxes.

How Sharp Are You at Finding Mistakes?

Put an X on each of the four examples with wrong answers. Then copy the examples in the boxes and work them correctly.

1.
$$\begin{array}{r} 59 \\ \times\ 36 \\ \hline 354 \\ 177 \\ \hline 531 \end{array}$$

2.
$$\begin{array}{r} \$90.50 \\ -\ 16.89 \\ \hline \$73.61 \end{array}$$

3.
$$\begin{array}{r} 386 \\ \times\ 27 \\ \hline 2\,602 \\ 7\,72 \\ \hline 10{,}322 \end{array}$$

4.
$$\begin{array}{r} \$151.24 \\ -\ 97.58 \\ \hline \$64.66 \end{array}$$

5.
$$\begin{array}{r} 8.05,\ \text{R2} \\ 9\overline{)\$76.47} \\ 76 \\ \hline 47 \\ 45 \\ \hline 2 \end{array}$$

How Good Are You at Solving Problems?

Work problems 1 to 8 and write your answers on the lines after the problems.

1. Paul feeds his dog $\frac{1}{2}$ can of dog food twice a day. How many cans of dog food does he need for a week?

---

2. If Lois saves a quarter a week for 10 weeks, how many dollars will she have?

---

3. How many $\frac{1}{4}$-pound boxes of nutmeats can Jo make from 2 lb.?

---

4. Helen bought $\frac{1}{2}$ doz. cupcakes, and Linda bought $\frac{1}{3}$ doz. Which girl bought more cupcakes?

How many cupcakes are there in $\frac{1}{2}$ doz.?

------ in $\frac{1}{3}$ doz.? ------

5. Sally needs a piece of lace 24 inches long. She has a piece $\frac{1}{2}$ yard long. How many inches too short is Sally's piece of lace?

---

6. There are 16 boys and 15 girls in Peter's class. If half of the boys and one third of the girls stay for lunch, how many children from the class will stay for lunch?

---

7. Alice bought 3 yd. of dress material at $1.98 a yard, and $\frac{1}{3}$ yd. of trimming at $1.50 a yard. How much did she spend in all?

---

8. Small eggs cost 58¢ a dozen, and the large ones cost 72¢ a dozen. Sue bought $\frac{1}{2}$ dozen large eggs. How much more did they cost than $\frac{1}{2}$ doz. small eggs?

Can You Choose Sensible Answers?

Circle the answer that is sensible.

1. Richard's bag of potato chips weighed _?_ lb. **$\frac{1}{4}$ $1\frac{1}{2}$ $2\frac{1}{2}$**

2. Frank is 9 years old. He is _?_ inches tall. **38 51 72**

3. Betsy's classroom is _?_ feet long. **90 70 30**

4. Harry is in the fifth grade. The length of his step is _?_ inches. **24 50 70**

5. Harry weighs _?_ lb. **150 60 32**

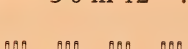
6. Janet served ice cream to 12 people. She used about _?_ qt. **8 2 1**



4 Two-Place Divisors That Are Even Tens

[*No remainders*]

A 3's in 12 = ?



$3\overline{)12}$ → 4

B 30's in 120 = ?



$30\overline{)120}$ → 4

1. Study boxes A and B. Can you see how the division fact "3's in 12 = 4" is a helper for the fact "30's in 120 = 4"?

We divide by tens just as we divide by ones.

In rows 2 and 3 below, the helping fact is printed in heavy type. The tiny x shows you where to write the quotient. Write just the quotients for rows 2 to 9.

	a	b	c
2.	$30\overline{)\overset{x}{210}}$	$40\overline{)\overset{x}{200}}$	$90\overline{)\overset{x}{360}}$
3.	$50\overline{)\overset{x}{450}}$	$80\overline{)\overset{x}{480}}$	$60\overline{)\overset{x}{540}}$
4.	$60\overline{)180}$	$20\overline{)140}$	$50\overline{)250}$
5.	$90\overline{)810}$	$80\overline{)720}$	$60\overline{)120}$
6.	$40\overline{)280}$	$70\overline{)560}$	$90\overline{)720}$
7.	$90\overline{)630}$	$40\overline{)320}$	$80\overline{)640}$
8.	$70\overline{)490}$	$90\overline{)540}$	$70\overline{)630}$
9.	$90\overline{)180}$	$70\overline{)210}$	$80\overline{)160}$

Read problems 10 to 16 carefully. Not all are division problems. Some have more than one step. Write answers on the lines.

10. Bruce worked on his music lesson 20 minutes a day for 6 days last week.

In all, he spent _____ minutes, or _____ hours, on his music.

11. In the parking lot at the zoo, 30 cars can be parked in a row. How many rows will be filled when there are 240 cars in the lot?

---

12. At the candy stand, Betty cut up the fudge in a big pan into 40 pieces. How many pieces are there in 3 big pans of fudge?

---

13. A swimming pool is 90 ft. long. How many times will Fred have to swim the length of the pool to swim 150 yards?

---

14. If 40 pages are needed for one magazine, how many magazines will 360 pages make?

---

15. In the Broadmeadow School, each class period is 40 minutes long. How many 40-minute periods are there between 9:00 A.M. and 1:00 P.M.?

---

16. 85 gallons of ice-cream mix will fill how many pint containers?

More about Dividing by Even Tens

[*Uneven division*]

1. Tom is packing apples in boxes. He puts 30 apples in each box. He can fill how many boxes if he has 220 apples?

To divide, we *think*, "There are as many 30's in 220 as there are 3's in 22."

3's in 22 = 7 and a remainder, so we write "7" in the quotient. Seven 30's = 210. 210 from 220 leaves 10.

A

$$\begin{array}{r} 7, \text{R}10 \\ 30\overline{)220} \\ \underline{210} \quad (7 \times 30) \\ 10 \end{array}$$

Tom can fill _____ boxes. He will have _____ apples left over.

2. When Tom has 140 apples, he can fill how many boxes?

For 30's in 140, use the helping fact 3's in 14 = 4 and a remainder.

Finish the division in box B.

B

$$30\overline{)140}$$

140 apples will fill 4 boxes and there will be _____ apples left over.

3. For 30's in 190, what helping fact would you use? _____

Finish the work in Ex. 4 to 7. Then divide in Ex. 8 to 22.

4. $60\overline{)270}$ — 4, R____ — $\underline{240}$

5. $70\overline{)550}$ — 7, R____ — $\underline{490}$

6. $80\overline{)330}$ — 4, R____

7. $50\overline{)480}$ — 9, R____

8. $40\overline{)190}$ **9.** $60\overline{)400}$ **10.** $80\overline{)530}$ **11.** $40\overline{)340}$ **12.** $70\overline{)350}$

13. $50\overline{)340}$ **14.** $80\overline{)290}$ **15.** $40\overline{)300}$ **16.** $70\overline{)510}$ **17.** $50\overline{)360}$

18. $70\overline{)670}$ **19.** $50\overline{)450}$ **20.** $80\overline{)700}$ **21.** $60\overline{)460}$ **22.** $90\overline{)840}$

23. Frank has 90 cabbage plants. He plants them in rows of 20 each.

He can make _____ rows, with _____ plants left over.

24. Pete has 170 tomato plants. How many rows of 30 can he make? _____

How many plants will be left? _____

Other Two-Place Divisors

[*1-place remainders*]



1. Helen has a piece of paper ribbon 168 inches long. How many streamers 21 inches long can she make? (Box A)

To divide, estimate the number of 21's in 168 by using the 20 (in 21) and the 160 (in 168).

A

$$21\overline{)168}\quad 8,\ \underline{168}\ (8 \times 21)$$

Think, "20's in 160 = 8, so there are probably eight 21's in 168."

Write "8" in the quotient and test the estimate by multiplying. $8 \times 21 = 168$, so 8 is the correct quotient.

2. A paper ribbon 248 in. long will make how many 41-inch streamers? How many inches will be left?

B

$$41\overline{)248}\quad 6,\ R2,\ \underline{246}\ (6 \times 41),\ 2$$

To divide (box B), *think*, "40's in 240 = _____." Six 41's = 246. There is a remainder of _____ in.

Finish the dividing in row 3. Then divide in rows 4 and 5.

	a	b	c	d
3.	4, R____ $82\overline{)329}$	3, R____ $92\overline{)279}$	5, R____ $81\overline{)408}$	3 $73\overline{)219}$
4.	$42\overline{)128}$	$81\overline{)729}$	$54\overline{)109}$	$83\overline{)249}$
5.	$71\overline{)289}$	$93\overline{)186}$	$52\overline{)209}$	$74\overline{)149}$

Working with Two-Place Divisors

[2-place remainders]

Steps for the division in box A

Divide. Estimate the number of 73's in 239 by using the 70 (in 73) and the 230 (in 239).

70's in 230 (or 7's in 23) = ____ and a remainder. Probably there are three 73's in 239.

Write "3" in the quotient in _____ place.

Multiply and compare to test the quotient.

3 × 73 = _____.

This product should not be larger than the dividend, 239.

Subtract and compare. 239 — 219 = _____. This remainder should be smaller than the divisor. Write the remainder, 20, beside the quotient.

A Write this: 3, R20 73)239 219 (3 × 73) 20	Think this: 3+ 70)230
B 84)179	Think:)____
C 63)159	)____
D 82)368	)____
E 92)298	)____

1. At the right in boxes B to E, write what you think to estimate quotients. Then do the divisions.

Divide in rows 2 and 3.

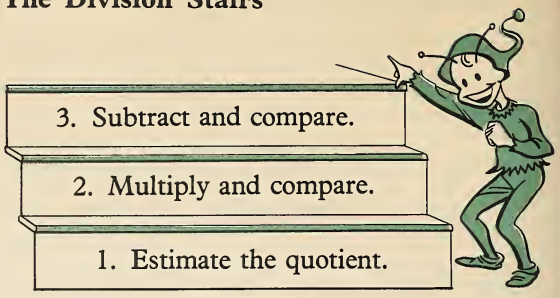
	a	b	c	d	e
2.	41)257	52)198	73)166	81)599	92)388
3.	23)79	62)289	43)139	91)879	53)179

Climb the Stairs to Find Correct Quotients

Watch the borrowing in the subtraction step in the examples on this page.

Write:	Think:	Check:
4, R12	4+	82
82)340	80)340	× 4
328 ←		328
12		+ 12
		340

The Division Stairs



Divide in rows 1 to 3.

	a	b	c	d	e
1.	44)92	81)673	92)300	73)201	61)513
2.	63)214	51)381	82)253	71)655	93)231
3.	41)387	90)775	62)290	84)204	72)336

In rows 4 and 5, there are mistakes in some of the work. Cross out wrong remainders and write correct ones.

	a	b	c
4.	9 91)843 819 36	2 74)167 148 19	3 53)191 159 42
5.	9 61)558 549 9	2 32)80 64 26	4 52)240 208 48

Find answers for the two parts of problem 6. Write the answers on the lines after the questions.

6. 170 chairs are needed for an outdoor movie on the church lawn. There are 21 boys to carry out the chairs. How many chairs will each boy have to carry?

How many chairs will still be left to carry out?

Fun at the Amusement Park

[*Mixed problems*]

1. Fred paid 27¢ each for merry-go-round tickets for his two sisters and himself. How much change did he receive from a dollar?

---

2. Betty and Sue bought hamburgers at 25¢ each and orange juice at 10¢ a glass. How much did these things cost for the two girls?

---

3. Fred bought a ham sandwich for 30¢, ice cream for 15¢, and two candy bars for 5¢ each. How much did he spend for these things?

---

4. All three children had a ride on the roller coaster. Their tickets cost $1.05. What did one ticket cost?

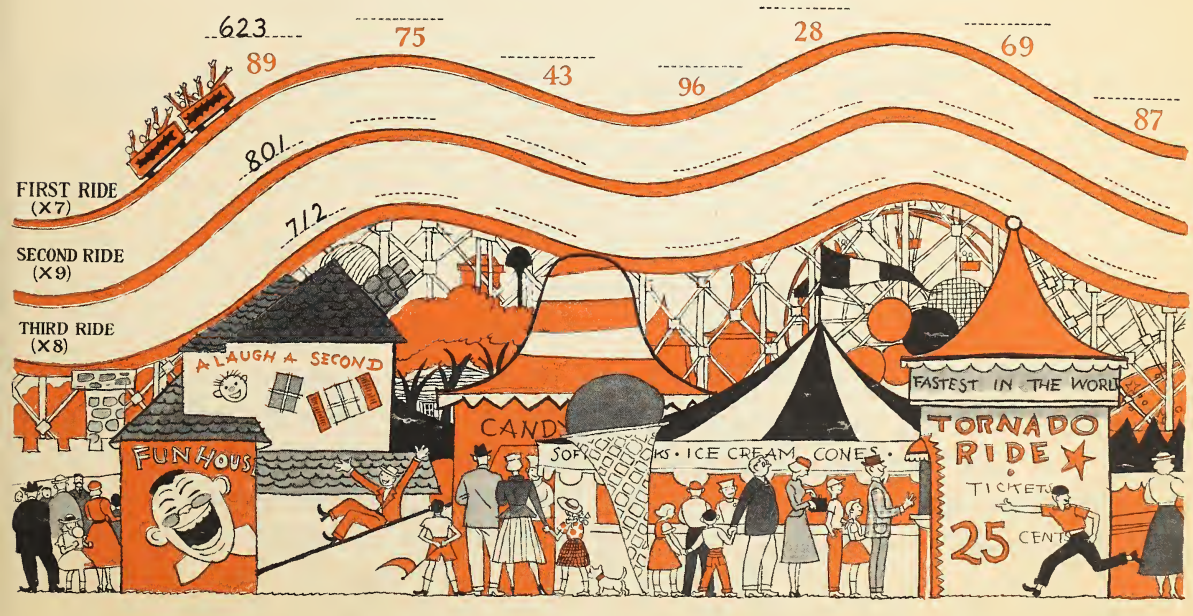
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5. One day, 356 people rode on the merry-go-round, but only $\frac{3}{4}$ as many people rode on the roller coaster. How many rode on the roller coaster?

---

6. If 42 children can ride in one bus, how many buses of the same size are needed to take 126 children to the amusement park?

Play this roller-coaster game. For the first ride, multiply the colored numbers by 7 and write the products on the lines. For the second ride, multiply the colored numbers by 9. For the third ride, multiply the colored numbers by 8. The first product for each ride is written for you.



Carrying in the Multiplication Step

Watch the carrying in the multiplication step in the examples on this page.

1. Study box A. Then work the example in box B. First write the estimating step and the multiplication step.

The product of the divisor and the estimated quotient must not be larger than the dividend.

The remainder (if any) must be smaller than the divisor.

A

$$84\overline{)599}\quad 7,\ \text{R}11$$

$$588$$

$$11$$

Think these steps:

$$80\overline{)590}\quad 7+$$

$$84 \times 7 = 588$$

B

$$95\overline{)393}$$

Estimate: $\quad)\overline{}$

Multiply: $\quad \times \underline{}$

Divide in rows 2 to 4. Check your work on another piece of paper.

	a	b	c	d	e	f
2.	$65\overline{)455}$	$76\overline{)486}$	$47\overline{)199}$	$95\overline{)686}$	$44\overline{)396}$	$55\overline{)185}$
3.	$87\overline{)284}$	$64\overline{)535}$	$97\overline{)399}$	$54\overline{)237}$	$56\overline{)398}$	$94\overline{)589}$
4.	$77\overline{)628}$	$33\overline{)268}$	$84\overline{)766}$	$67\overline{)357}$	$86\overline{)378}$	$94\overline{)497}$

Find answers for problems 5 and 6.

5. Walter's hens lay an average of 32 eggs a day. How many days does it take to get 16 dozen eggs?

HELPER: 16 doz. = _?_ eggs.

---

6. Henry is helping his father put potatoes in bags. They put 15 lb. into each bag. Will 80 bags of potatoes use more or less than $\frac{1}{2}$ ton of potatoes?

HELPER: 1 ton = 2,000 lb.

Watch both Carrying and Borrowing!

A	B	C	D
8 (too large) 84)604 672 (too large)	6 (too small) 75)530 450 80 (too large)	3 57)230 171 59	8 97)702 776
Correct 7, R16 84)604 588 (7 × 84) 16	**Correct** 7, R5 75)530 525 (7 × 75) 5	57)2 3 0	97)7 0 2

In boxes A to D, the divisions in the top part of the boxes are not correct.

1. Box A. The product, 672, cannot be subtracted from 604, so we know that the quotient, 8, is too large. The example is worked correctly in the lower part of the box.

The correct answer is ____, R_____.

2. Box B. The remainder, 80, is larger than the divisor, 75.

Then the quotient, 6, is too _____.

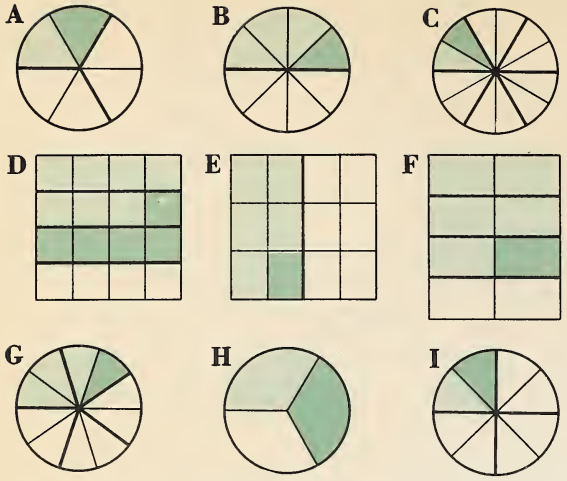
The correct answer is _____, R_____.

3. Boxes C and D. Mark quotients, products, and remainders that are too large or too small. Then do the work correctly.

Divide in rows 4 and 5.

	a	b	c	d	e	f
4.	65)2 2 1	54)2 3 2	76)4 8 3	87)5 5 1	94)3 4 0	67)3 4 2
5.	84)6 9 1	55)4 4 0	74)4 6 0	96)3 1 6	77)6 1 6	56)4 4 8

Changing Fractions in Answers to Best Form



Finish the additions in Ex. 1 to 8. Write the letter of the drawing which proves that each sum (in best form) is correct.

1. $\frac{3}{8}+\frac{1}{8}=\frac{\quad}{8}$, or $\frac{\quad}{2}$ ------

2. $\frac{1}{12}+\frac{1}{12}=\frac{\quad}{12}$, or $\frac{\quad}{\quad}$ ------

3. $\frac{1}{6}+\frac{1}{6}=\frac{\quad}{\quad}$, or $\frac{\quad}{\quad}$ ------

4. $\frac{5}{8}+\frac{1}{8}=\frac{\quad}{\quad}$, or $\frac{\quad}{\quad}$ ------

5. $\frac{7}{16}+\frac{5}{16}=\frac{\quad}{\quad}$, or $\frac{\quad}{\quad}$ ------

6. $\frac{5}{12}+\frac{1}{12}=\frac{\quad}{\quad}$, or $\frac{\quad}{\quad}$ ------

7. $\frac{1}{8}+\frac{1}{8}=\frac{\quad}{\quad}$, or $\frac{\quad}{\quad}$ ------

8. $\frac{3}{10}+\frac{1}{10}=\frac{\quad}{\quad}$, or $\frac{\quad}{\quad}$ ------

9. In best form, $\frac{6}{9}=$ ---------.

10. In best form, $\frac{8}{10}=$ ---------.

[*Review*]

Find answers for Ex. 11–18. Be sure to give answers in best form. Be careful —these are not all addition problems.

11. Sam walked $\frac{1}{4}$ mile to Ed's house, then $\frac{1}{4}$ mile farther to the swimming pool. He walked how far in all?

---

12. Ed and Sam each ate $\frac{1}{8}$ of a melon. What part of the whole melon did they eat?

---

13. Sally lives $\frac{7}{8}$ mile from the pool, and Helen lives $\frac{1}{8}$ mile from it. How much farther from the pool does Sally live than Helen?

---

14. A bag of potato chips weighed $\frac{9}{16}$ lb., and a bag of popcorn weighed $\frac{5}{16}$ lb. Together they weighed how much?

---

15. How much less did the popcorn weigh than the potato chips?

---

16. Mary's box of salted nuts weighs $\frac{15}{16}$ lb. If the box weighs $\frac{3}{16}$ lb., what do the nuts weigh?

---

17. Ann mailed two packages, each weighing $\frac{7}{16}$ lb. What did the two packages weigh?

---

18. It took Ann 15 minutes to walk to the post office and the same length of time to walk home. What part of an hour did Ann spend in walking?

Easy Addition and Subtraction of Mixed Numbers

[*No carrying or borrowing*]

1. Jean needs $1\frac{1}{8}$ cups of sugar for a cake, and Betty needs $2\frac{1}{8}$ cups for candy. In all, how many cups of sugar do Jean and Betty need?

Finish the work in box A by changing $3\frac{2}{8}$ to best form.

A

$$\begin{array}{r} 1\frac{1}{8} \\ +\ 2\frac{1}{8} \\ \hline 3\frac{2}{8} = \end{array}$$

$1\frac{1}{8} + 2\frac{1}{8} =$ _____, or _____.

We change fractions in answers to lowest terms (best form).

2. The sugar tin had $5\frac{3}{4}$ cups in it. The girls used $3\frac{1}{4}$ cups. How many cups were left?

Finish box B.

B

$$\begin{array}{r} 5\frac{3}{4} \\ -\ 3\frac{1}{4} \\ \hline 2\frac{2}{4} = \end{array}$$

$5\frac{3}{4} - 3\frac{1}{4} =$ _____, or _____.

Add or subtract in rows 3 to 8.

	a	b	c
3.	$4\frac{3}{8}$ $+\ 2\frac{3}{8}$	$2\frac{1}{4}$ $+\ 1\frac{1}{4}$	$5\frac{7}{8}$ $-\ 1\frac{1}{8}$
4.	$7\frac{4}{5}$ $-\ 6\frac{1}{5}$	$4\frac{1}{3}$ $+\ 5\frac{1}{3}$	$7\frac{1}{5}$ $+\ 1\frac{3}{5}$
5.	$3\frac{9}{16}$ $-\ 2\frac{7}{16}$	$5\frac{11}{12}$ $-\ 1\frac{7}{12}$	$7\frac{1}{8}$ $+\ 2\frac{5}{8}$
6.	$5\frac{1}{12}$ $+\ 3\frac{1}{12}$	$9\frac{7}{8}$ $-\ 2\frac{5}{8}$	$4\frac{15}{16}$ $-\ 2\frac{9}{16}$
7.	$9\frac{7}{16}$ $+\ 2\frac{1}{16}$	$6\frac{5}{12}$ $+\ 3\frac{1}{12}$	$4\frac{13}{16}$ $-\ 1\frac{5}{16}$
8.	$8\frac{11}{12}$ $-\ 3\frac{5}{12}$	$8\frac{9}{16}$ $+\ 2\frac{3}{16}$	$1\frac{1}{12}$ $+\ 6\frac{7}{12}$

Find answers for problems 9 to 13 and write them on the lines after the problems. Be sure your answers are in best form.

9. After Sally used $2\frac{3}{8}$ yd. of ribbon to tie up a birthday present, she had $1\frac{1}{8}$ yd. left. Sally's ribbon had been how many yards long?

_____

10. In Ex. 9, the piece of ribbon Sally used was how many yards longer than the piece that was left?

_____

11. Chuck had a board $7\frac{2}{3}$ ft. long. He sawed off a piece $2\frac{1}{3}$ ft. long. How long was the piece that was left?

_____

12. Jean's mother had $2\frac{5}{12}$ doz. eggs. She used $1\frac{1}{12}$ doz. for egg sandwiches. How many dozen were left?

_____

13. For Ex. 12, see if you can change from dozens to find how many eggs Mother

a. had at first; 29_____

b. used for sandwiches; _____

c. had left. _____

Zeros in Subtraction of Mixed Numbers

1. A year ago, Ralph was $61\frac{7}{8}$ in. tall. Now he is $64\frac{7}{8}$ in. tall. How many inches has he grown?

Box A shows the work.

A

$$\begin{array}{r} 64\frac{7}{8} \\ -\ 61\frac{7}{8} \\ \hline 3 \end{array}$$

Ralph has grown _____ inches.

Notice that we **do not write a zero** in the fraction column in the answer. A zero would make the answer 30. Is 30 a sensible answer?

---

2. Dot weighs $97\frac{3}{4}$ lb. Her friend Gail weighs 91 lb. How much less does Gail weigh than Dot?

Box B shows the work.

B

$$\begin{array}{r} 97\frac{3}{4} \\ -\ 91 \\ \hline 6\frac{3}{4} \end{array}$$

Gail weighs _____ lb. less than Dot.

3. Two weeks ago Dot's kitten weighed $2\frac{1}{8}$ lb. Now it weighs $2\frac{7}{8}$ lb. How much weight has it gained?

Box C shows the work.

C

$$\begin{array}{r} 2\frac{7}{8} \\ -\ 2\frac{1}{8} \\ \hline \frac{6}{8} = ? \end{array}$$

Dot's kitten has gained _____ lb.

In box C, no zero is needed in one's place in the answer. But in box D we need to write a zero to show that there is no remainder at all.

D

$$\begin{array}{r} 5\frac{1}{2} \\ -\ 5\frac{1}{2} \\ \hline 0 \end{array}$$

Subtract in Ex. 4 to 12.

4. $7\frac{3}{8} - 4\frac{3}{8}$

5. $9\frac{15}{16} - 9\frac{1}{16}$

6. $20\frac{4}{5} - 18$

[No borrowing]

7. $3\frac{13}{16} - \frac{7}{16}$

8. $16\frac{3}{4} - 9$

9. $8\frac{4}{5} - 8\frac{4}{5}$

10. $5\frac{11}{12} - \frac{7}{12}$

11. $12\frac{9}{10} - 12\frac{1}{10}$

12. $6\frac{5}{6} - 2\frac{5}{6}$

Add or subtract in Ex. 13 to 18.

13. $\frac{1}{12} + 9\frac{7}{12}$

14. $7 + 2\frac{4}{5}$

15. $9\frac{2}{3} - 4\frac{2}{3}$

16. $1\frac{3}{10} + 5$

17. $6\frac{15}{16} - 2\frac{3}{16}$

18. $8\frac{5}{6} + 9$

Find answers for problems 19 to 21. Use the space below for your work.

19. To make curtains for a long window, Mrs. Ross used $6\frac{1}{4}$ yd. of material. For a shorter window she used $4\frac{1}{4}$ yd. That was how many yards in all?

---

20. In Ex. 19, the long window takes how many more yards of material than the short window?

---

21. A new picture for the living room is $14\frac{5}{16}$ in. wide. An old picture was $9\frac{1}{16}$ in. wide. How much wider is the new picture?

Changing Improper Fractions to Whole or Mixed Numbers

A



The circles in box A are colored to show that the improper fraction $\frac{27}{12}$ equals the mixed number $2\frac{3}{12}$, or $2\frac{1}{4}$.

1. Color or shade parts of drawings B to E to show the improper fractions and mixed numbers given in the boxes.

B

Show that $\frac{6}{4} = 1\frac{2}{4} = 1\frac{1}{2}$.



C

Show that $\frac{22}{8} = 2\frac{6}{8} = 2\frac{3}{4}$.



D

Show that $\frac{9}{6} = 1\frac{3}{6} = 1\frac{1}{2}$.



E

Show that $\frac{8}{3} = 2\frac{2}{3}$.



Circle the improper fractions in rows 2 and 3, below.

2. $\frac{7}{8}$ $\frac{19}{12}$ $\frac{20}{16}$ $\frac{2}{6}$ $\frac{8}{4}$ $\frac{2}{5}$

3. $\frac{5}{2}$ $\frac{13}{16}$ $\frac{4}{12}$ $\frac{9}{5}$ $\frac{20}{10}$ $\frac{5}{6}$

Copy the improper fractions from rows 2 and 3 and change them to whole numbers or mixed numbers.

4. ---------- ---------- ----------

5. ---------- ---------- ----------

Add in rows 6 to 9. Change fractions in sums to best form.

	a	b	c
6.	$\frac{5}{8} + \frac{7}{8}$	$\frac{7}{12} + \frac{5}{12}$	$\frac{9}{16} + \frac{11}{16}$
7.	$\frac{9}{10} + \frac{7}{10}$	$\frac{5}{6} + \frac{5}{6}$	$\frac{3}{4} + \frac{3}{4} + \frac{3}{4}$
8.	$\frac{5}{12} + \frac{11}{12} + \frac{1}{12}$	$\frac{7}{16} + \frac{11}{16} + \frac{5}{16}$	$\frac{5}{8} + \frac{7}{8} + \frac{1}{8}$
9.	$\frac{3}{5} + \frac{4}{5}$	$\frac{7}{10} + \frac{9}{10} + \frac{3}{10}$	$\frac{9}{10} + \frac{7}{10} + \frac{9}{10}$

Adding Mixed Numbers with Carrying

A

Think this: $\frac{12}{12} = 1$, so $\frac{18}{12} = 1\frac{6}{12}$

$$\begin{array}{r} 5\frac{7}{12} \\ +\ 2\frac{11}{12} \\ \hline 7\frac{18}{12} \end{array} = 7 + 1\frac{6}{12} = 8\frac{6}{12} = 8\frac{1}{2}$$

B

$$\begin{array}{r} 2\frac{9}{16} \\ +\ 1\frac{7}{16} \\ \hline 3\frac{16}{16} \end{array} = 3 + 1 = 4$$

1. In Ex. A and B, we get what kind of fraction when we add the fraction column?

---

2. In which example is the improper fraction changed to a whole number?

In which example is it changed to a mixed number?

It is quicker to do the carrying "in your head." Then you can write your work in the short way shown in box C. Study the work in box C. Then finish the work in boxes D to F.

C

$$\begin{array}{r} 5\frac{3}{8} \\ +\ 4\frac{7}{8} \\ \hline 9\frac{10}{8} \end{array} = 10\frac{2}{8} = 10\frac{1}{4}$$

D

$$\begin{array}{r} 2\frac{3}{10} \\ +\ 4\frac{7}{10} \\ \hline 6\frac{10}{10} \end{array} = \text{----}$$

E

$$\begin{array}{r} 3\frac{9}{16} \\ +\ 4\frac{11}{16} \\ \hline 7\frac{20}{16} \end{array} = 8\frac{4}{16} = \text{-----}$$

F

$$\begin{array}{r} 5\frac{3}{5} \\ +\ 2\frac{4}{5} \\ \hline 7\frac{7}{5} \end{array} = \text{-----}$$

Add in rows 3 to 6. Write your work the short way.

	a	b
3.	$3\frac{4}{5} + 8\frac{4}{5}$	$1\frac{7}{8} + 7\frac{5}{8}$
4.	$8\frac{3}{10} + 1\frac{9}{10}$	$3\frac{3}{8} + 2\frac{5}{8}$
5.	$3\frac{9}{10} + 5\frac{7}{10}$	$5\frac{9}{16} + \frac{13}{16}$
6.	$4\frac{7}{12} + 1\frac{5}{12}$	$5\frac{3}{16} + 2\frac{9}{16}$

Find answers for problems 7 to 9.

7. Joe bought 2 heads of cabbage. One weighed $2\frac{7}{8}$ lb., and the other one weighed $2\frac{1}{8}$ lb. Both weighed how much?

---

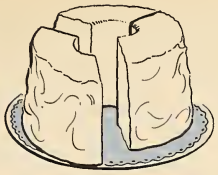
8. The $2\frac{1}{8}$-pound head of cabbage weighed how much less than the $2\frac{7}{8}$-pound head?

---

9. Janet bought $2\frac{3}{4}$ lb. of red grapes and $1\frac{3}{4}$ lb. of green grapes. How many pounds was that in all?

Subtracting a Fraction from a Whole Number

1. Mary baked a big angel food cake. She took $\frac{1}{3}$ of the cake to her cousin. What part of the cake was left?



Think, "$1 = \frac{\quad}{3}$. Then $\frac{3}{3} - \frac{1}{3} = \frac{\quad}{3}$."

Write the missing numbers in Ex. 2–5.

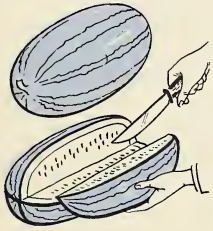
2. For $1 - \frac{3}{4}$, *think*, "$\frac{\quad}{4} - \frac{3}{4} = \frac{\quad}{4}$."

3. For $1 - \frac{1}{6}$, *think*, "$\frac{\quad}{6} - \frac{1}{6} =$ ....."

4. For $1 - \frac{3}{8}$, *think*, "$\frac{\quad}{8} - \frac{3}{8} =$ ....."

5. For $1 - \frac{2}{5}$, *think*, "$\frac{\quad}{5} - \frac{2}{5} =$ ....."

6. Tom has 2 melons. If he eats $\frac{1}{4}$ of a melon, how much will he have left?



To subtract $\frac{1}{4}$ from 2, think of 2 as $1\frac{4}{4}$.

Then $1\frac{4}{4} - \frac{1}{4} = 1\frac{\quad}{4}$.

Write the missing numbers.

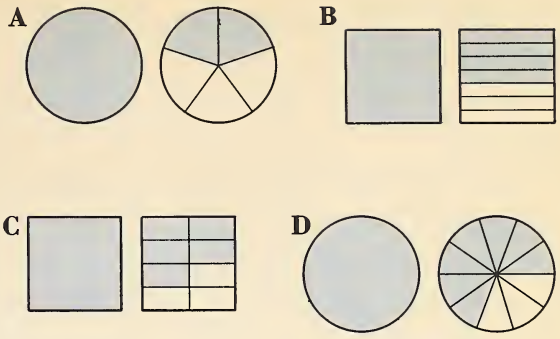
7. $3 - \frac{5}{6} = 2\frac{6}{6} - \frac{5}{6} = 2\frac{\quad}{6}$.

8. $2 - \frac{2}{5} = 1\frac{5}{5} - \frac{2}{5} = 1\frac{\quad}{5}$.

9. $4 - \frac{5}{8} = 3\frac{\quad}{8} - \frac{5}{8} =$ .....

10. $5 - \frac{2}{3} = 4\frac{\quad}{3} - \frac{2}{3} =$ .....

11. $7 - \frac{3}{4} = 6\frac{\quad}{4} - \frac{3}{4} =$ .....



Write just the answers for Ex. 12–15. Use the drawings above to help you.

12. $2 - \frac{3}{8} =$ ..... **13.** $2 - \frac{3}{7} =$ .....

14. $2 - \frac{3}{5} =$ ..... **15.** $2 - \frac{3}{10} =$ .....

Ex. 16 and 17 show the change that must be made in one of the wholes before the fraction can be subtracted. Finish the work.

16.
$5 = 4\frac{10}{10}$
$-\frac{1}{10} = \frac{1}{10}$

17.
$3 = 2\frac{16}{16}$
$-\frac{9}{16} = \frac{9}{16}$

Do the work for the following in the same way as Ex. 16 and 17 are worked:

18.
7
$-\frac{3}{16}$

19.
9
$-\frac{1}{12}$

20.
8
$-\frac{7}{10}$

21.
9
$-\frac{5}{6}$

Subtracting a Mixed Number from a Whole Number

1. Sally needs 4 cups of milk to make cocoa for breakfast. She has $1\frac{2}{3}$ cups in a pitcher. How many more cups does she need?

See box A. We need some thirds from which to subtract. We change 1 of the 4 wholes to $\frac{3}{3}$. Finish the work.

A

$$4 = 3\frac{3}{3}$$
$$-\ 1\frac{2}{3} = 1\frac{2}{3}$$

Sally needs _____ more cups of milk.

2. Sally had a piece of bacon that weighed 2 lb. After she cut off $1\frac{3}{8}$ lb., how much bacon was left?

See box B. We need some eighths from which to subtract, so we change 1 of the 2 wholes to $\frac{8}{8}$. Finish the work.

B

$$2 = 1\frac{8}{8}$$
$$-\ 1\frac{3}{8} = 1\frac{3}{8}$$

_____ pound of bacon was left.

3. $1\frac{1}{4}$ dozen eggs from 3 dozen leaves how many dozen?

In box C, we need some _____.

We change 1 whole to _____. Then we have $2\frac{\ }{4}$. Finish Ex. C.

C

$$3 = 2\frac{4}{4}$$
$$-\ 1\frac{1}{4} = 1\frac{1}{4}$$

_____ dozen eggs are left.

Write the missing numerators below.

	a	b	c
4.	$8 = 7\frac{\ }{2}$	$5 = 4\frac{\ }{6}$	$6 = 5\frac{\ }{12}$

Finish the work in Ex. 5 to 8.

5. $9 = 8\frac{5}{5}$
$-\ 1\frac{4}{5} = 1\frac{4}{5}$

6. $8 = 7\frac{6}{6}$
$-\ 4\frac{1}{6} = 4\frac{1}{6}$

7. $7 = 6\frac{12}{12}$
$-\ 5\frac{1}{12} = 5\frac{1}{12}$

8. $8 = 7\frac{10}{10}$
$-\ 2\frac{3}{10} = 2\frac{3}{10}$

Do Ex. 9–12 in the same way as above.

9. $6 - 2\frac{5}{8}$

10. $9 - 8\frac{5}{7}$

11. $5 - 3\frac{9}{10}$

12. $8 - 5\frac{7}{16}$

Work Ex. 13 to 20. Watch the signs!

13. $8\frac{9}{16} + 2\frac{7}{16}$

14. $4\frac{11}{12} - 2\frac{5}{12}$

15. $3\frac{7}{10} + 8\frac{9}{10}$

16. $15\frac{7}{8} - 9\frac{3}{8}$

17. $7\frac{4}{5} + 9\frac{4}{5}$

18. $8 + 1\frac{3}{5}$

19. $6\frac{3}{8} - 4\frac{3}{8}$

20. $10\frac{3}{16} + 4\frac{5}{16}$

Subtracting from a Mixed Number

1. Mother has $2\frac{1}{4}$ cakes. She plans to serve $\frac{3}{4}$ of a cake for dinner. Then how much cake will she have left?

To find the answer, Sue made drawings of the cakes.



Step 1. Sue drew $2\frac{1}{4}$ cakes to show how much cake there was at first.

Step 2. To take away $\frac{3}{4}$, she needed more fourths, so she cut 1 whole cake into fourths. Then she had $1\frac{\quad}{4}$.



Step 3. Sue colored all but $\frac{3}{4}$ (the part that was to be served). In all, Sue colored $1\frac{2}{4}$, or $1\frac{\quad}{2}$.



We can use numbers to show all the steps in Sue's work. See the box below.

We cannot subtract $\frac{3}{4}$ from $\frac{1}{4}$, so we change 1 of the 2 wholes to $\frac{4}{4}$. Then we add the $\frac{4}{4}$ to $\frac{1}{4}$ to make $\frac{5}{4}$.

Finish the work.

$$2\tfrac{1}{4} = 1\tfrac{5}{4}$$
$$-\tfrac{3}{4} = \tfrac{3}{4}$$

Write the missing numerators:

2. $5\frac{1}{8} = 4\frac{\quad}{8}$

3. $7\frac{3}{16} = 6\frac{\quad}{16}$

4. $8\frac{3}{10} = 7\frac{\quad}{10}$

5. $5\frac{7}{16} = 4\frac{\quad}{16}$

6. $9\frac{2}{5} = 8\frac{\quad}{5}$

7. $6\frac{1}{3} = 5\frac{\quad}{3}$

8. $2\frac{1}{6} = 1\frac{\quad}{6}$

9. $2\frac{7}{12} = 1\frac{\quad}{12}$

10. $7\frac{5}{12} = 6\frac{\quad}{12}$

11. $6\frac{7}{10} = 5\frac{\quad}{10}$

Finish the subtractions below.

12. $5\frac{1}{8} = 4\frac{9}{8}$
$-\ 3\frac{5}{8} = 3\frac{5}{8}$

13. $3\frac{2}{5} = 2\frac{7}{5}$
$-\ \frac{4}{5} = \frac{4}{5}$

14. $5\frac{1}{10} = 4\frac{11}{10}$
$-\ 1\frac{7}{10} = 1\frac{7}{10}$

15. $9\frac{5}{12} = 8\frac{17}{12}$
$-\ 3\frac{7}{12} = 3\frac{7}{12}$

Subtract in Ex. 16 to 25.

16. $8\frac{1}{5} - 1\frac{2}{5}$

17. $9\frac{1}{12} - 4\frac{7}{12}$

18. $5\frac{3}{16} - 2\frac{13}{16}$

19. $6\frac{3}{10} - 4\frac{7}{10}$

20. $2\frac{1}{8} - \frac{7}{8}$

21. $5\frac{7}{10} - 3\frac{9}{10}$

22. $10\frac{3}{8} - 4\frac{5}{8}$

23. $8\frac{15}{16} - 7\frac{1}{16}$

24. $5\frac{7}{12} - 1\frac{11}{12}$

25. $9\frac{3}{5} - 2\frac{4}{5}$

A Short Cut in Column Addition of Mixed Numbers

1. In adding the fractions in box A, Bob sees that $\frac{1}{8} + \frac{7}{8} = \frac{8}{8}$, or 1, which he carries to the whole-number column.

He writes _____ under the fraction column and adds the whole numbers.

A

$$\begin{array}{r} {\scriptstyle 1} \\ 5\frac{1}{8} \\ 2\frac{3}{8} \\ +\ 1\frac{7}{8} \\ \hline 9\frac{3}{8} \end{array}$$

Short cut: Look for fractions that you can put together to make 1 whole to carry to the whole-number column.

2. Box B. The arrow shows the short-cut way to add the fractions. $\frac{3}{10} + \frac{7}{10} = 1$ to carry. Finish the work.

B

$$\begin{array}{r} 7\frac{9}{10} \\ 1\frac{3}{10} \\ +\ 4\frac{7}{10} \\ \hline \end{array}$$

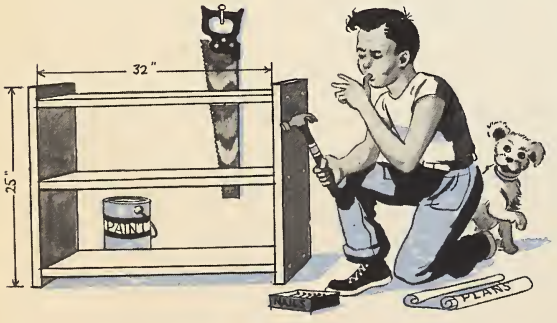
3. Box C. We need just $\frac{1}{16}$ more to put with the $\frac{15}{16}$ to make 1 whole. We can use one of the $\frac{3}{16}$ in $2\frac{3}{16}$. Then there are $\frac{2}{16}$ left to add to the $\frac{7}{16}$. Finish the work in box C.

C

$$\begin{array}{r} 4\frac{15}{16} \\ 2\frac{3}{16} \\ +\ 3\frac{7}{16} \\ \hline \end{array}$$

Add in rows 4 and 5. Use the short cut.

	a	b	c	d	e	f	g
4.	$3\frac{1}{2}$ $2\frac{1}{2}$ $+\ 4\frac{1}{2}$	$4\frac{1}{6}$ $3\frac{5}{6}$ $+\ 1\frac{1}{6}$	$2\frac{5}{12}$ $8\frac{11}{12}$ $+\ 3\frac{1}{12}$	$4\frac{2}{3}$ $5\frac{2}{3}$ $+\ 9$	$6\frac{3}{4}$ $2\frac{3}{4}$ $+\ 1\frac{1}{4}$	$2\frac{3}{16}$ $4\frac{9}{16}$ $+\ 3\frac{15}{16}$	$\frac{3}{10}$ $7\frac{9}{10}$ $+\ 1\frac{3}{10}$
5.	$8\frac{1}{10}$ $2\frac{3}{10}$ $+\ 4\frac{7}{10}$	$1\frac{7}{12}$ $6\frac{5}{12}$ $+\ 3\frac{11}{12}$	$3\frac{5}{16}$ $\frac{11}{16}$ $+\ 2\frac{9}{16}$	$9\frac{4}{5}$ 7 $+\ 2\frac{2}{5}$	$4\frac{1}{8}$ $3\frac{5}{8}$ $+\ 4\frac{3}{8}$	$5\frac{6}{7}$ $2\frac{5}{7}$ $+\ 1$	$3\frac{11}{12}$ 9 $+\ 6\frac{7}{12}$



6. How long a board did Dan need to make the three shelves for the bookcase in the picture above?

_____

7. Could Dan cut the two sides from a board $4\frac{1}{2}$ ft. long?

_____

8. Sally is making a lunch cloth. It is $1\frac{3}{4}$ yd. long and $1\frac{1}{4}$ yd. wide. How many yards of lace does she need to go around it?

_____

9. Bill and his puppy together weigh $81\frac{3}{4}$ lb. Bill weighs 76 lb. How much does the puppy weigh?

_____

Playing a Missing Number Game



The boys in the picture are asking number questions, and the girls are answering them. For every correct answer, the girls score 1 point. Next it will be their turn to ask the questions.

Bob. What number added to $4\frac{2}{3}$ equals 5?

Ann. The missing number (n) is $\frac{1}{3}$, because $4\frac{2}{3} + \frac{1}{3} = 5$. If I couldn't think it, I could subtract. $5 - 4\frac{2}{3} = \frac{1}{3}$.

$4\frac{2}{3} + n = 5$; $4\frac{2}{3} + (\frac{1}{3}) = 5$; $n = \frac{1}{3}$
Check: $5 - 4\frac{2}{3} = \frac{1}{3}$

Phil. From what number can I subtract $\frac{1}{4}$ and have $\frac{3}{4}$ left?

Helen. The missing number (n) is 1, because $1 - \frac{1}{4} = \frac{3}{4}$. To check, I think, "$\frac{3}{4} + \frac{1}{4} = \frac{4}{4}$, or 1."

Ted. What number subtracted from $6\frac{1}{2}$ leaves 5?

Rae. The missing number (n) is $1\frac{1}{2}$, because $6\frac{1}{2} - 1\frac{1}{2} = 5$. If I couldn't think it, I could subtract. $6\frac{1}{2} - 5 = 1\frac{1}{2}$.

$6\frac{1}{2} - n = 5$; $6\frac{1}{2} - (1\frac{1}{2}) = 5$; $n = 1\frac{1}{2}$
Check: $6\frac{1}{2} - 5 = 1\frac{1}{2}$

Find n in Ex. 1 to 8. Write the check under each example.

1. $3\frac{5}{8} + n = 4\frac{5}{8}$. $n =$ _____

   Check: $4\frac{5}{8} - 3\frac{5}{8} =$ _____

2. $5\frac{1}{2} + n = 6$. $n =$ _____

   Check: _____

3. $n + \frac{7}{8} = 2$. $n =$ _____

   Check: _____

4. $n + 2\frac{1}{4} = 3$. $n =$ _____

   Check: _____

5. $n - \frac{5}{8} = \frac{3}{8}$. $n =$ _____

   Check: _____

6. $n - 1\frac{1}{4} = \frac{3}{4}$. $n =$ _____

   Check: _____

7. $5\frac{1}{3} - n = 5$. $n =$ _____

   Check: _____

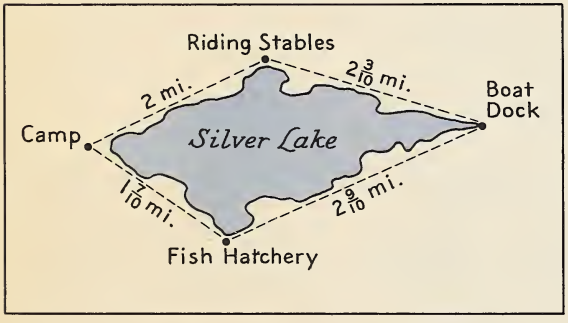
8. $4\frac{7}{8} - n = \frac{7}{8}$. $n =$ _____

   Check: _____

From Easy to Difficult Addition of Mixed Numbers

[*Like-denominators*]

	a	b	c	d	e	f
1.	$2\frac{1}{3}$ $+4\frac{1}{3}$	$6\frac{3}{8}$ $+7\frac{3}{8}$	8 $+2\frac{4}{5}$	$3\frac{7}{16}$ $+\frac{5}{16}$	$9\frac{7}{12}$ $+2\frac{1}{12}$	$7\frac{3}{10}$ $+4\frac{1}{10}$
2.	$3\frac{4}{5}$ $+2\frac{1}{5}$	$10\frac{2}{3}$ $+8\frac{2}{3}$	$2\frac{5}{6}$ $+\frac{5}{6}$	$6\frac{7}{10}$ $+1\frac{9}{10}$	$8\frac{5}{16}$ $+2\frac{13}{16}$	$2\frac{11}{12}$ $+1\frac{7}{12}$
3.	$3\frac{7}{8}$ $4\frac{3}{8}$ $+\frac{5}{8}$	$8\frac{4}{5}$ $9\frac{4}{5}$ $+7\frac{3}{5}$	$5\frac{7}{12}$ $3\frac{11}{12}$ $+4\frac{5}{12}$	$8\frac{9}{10}$ $1\frac{7}{10}$ $+3\frac{1}{10}$	$1\frac{5}{16}$ $4\frac{9}{16}$ $+2\frac{13}{16}$	$3\frac{5}{6}$ $1\frac{5}{6}$ $+2\frac{5}{6}$



Find answers for problems 4 to 9. Use the map to find distances you need to know.

4. Bob and Jack rode their bicycles from camp to the riding stables, then to the boat dock. They reached the boat dock at 11:45. How far had they gone?

---

5. At the dock, Bob said, "Let's eat our lunch here and wait for the big boat to come in." In all, the boys were there for $\frac{3}{4}$ hour. At what time did they leave?

---

6. Bob and Jack rode on to the fish hatchery. Then they had gone how many miles from camp?

---

7. How much farther is it from the boat dock to the hatchery than from the stables to the dock?

---

8. How many miles long was Bob and Jack's whole trip around Silver Lake?

---

9. How much farther did the boys ride after lunch than before lunch?



From Easy to Difficult Subtraction of Mixed Numbers

[*Like-denominators*]

	a	b	c	d	e
1.	$6\frac{2}{3}$	$3\frac{4}{5}$	$16\frac{7}{8}$	$4\frac{7}{12}$	$8\frac{15}{16}$
	$-4\frac{1}{3}$	$-\frac{2}{5}$	$-9\frac{7}{8}$	$-4\frac{5}{12}$	$-2\frac{7}{16}$
2.	1	3	4	9	15
	$-\frac{7}{8}$	$-\frac{2}{5}$	$-\frac{7}{10}$	$-1\frac{5}{12}$	$-8\frac{3}{4}$
3.	$2\frac{1}{4}$	$7\frac{1}{10}$	$4\frac{1}{6}$	$8\frac{7}{12}$	$10\frac{2}{5}$
	$-\frac{3}{4}$	$-1\frac{7}{10}$	$-\frac{5}{6}$	$-1\frac{11}{12}$	$-4\frac{4}{5}$

Here are some more problems about Bob and Jack. Work the problems and write the answers on the lines.

4. Bob and Jack fished for $2\frac{1}{4}$ hr. one morning and for $1\frac{3}{4}$ hr. that afternoon. How many hours did they fish in all?

---

5. The first fish Bob caught weighed $1\frac{7}{8}$ lb. Jack's first one weighed $2\frac{5}{8}$ lb. How much heavier was Jack's fish than Bob's?

---

6. Bob caught two other fish weighing $1\frac{1}{8}$ lb. and $1\frac{5}{8}$ lb. How much did Bob's three fish weigh?



7. Jack caught only one other fish. It weighed 2 lb. How much did his two fish weigh?

---

8. Bob walked $1\frac{3}{10}$ mi. to the store, then home again. He walked how far in all?

Can You Multiply by Even Hundreds?

A

$100 \times 5 = 500$

$100 \times 42 = 4{,}200$

$100 \times 87 =$ _____

$100 \times 748 = 74{,}800$

$100 \times 519 =$ _____

$100 \times 703 = 70{,}300$

$100 \times 908 =$ _____

1. Study the work in box A and write the missing products.

To multiply a whole number by 100, put two zeros at the right of the number.

2. Multiply each number below by 100.

38_____ 472_____

59_____ 687_____

643_____ 806_____

705_____ 382_____

3. Box B. $2 \times 342 =$ _____.

Box C. To multiply 342 by 200, we first write zeros in one's and ten's places in the product. Then we multiply 342 by the 2 of 200 and write this product with the 4 in hundred's place.

$200 \times 342 =$ _____

B

$$\begin{array}{r} 342 \\ \times\ 2 \\ \hline 684 \end{array}$$

C

$$\begin{array}{r} 342 \\ \times\ 200 \\ \hline 68{,}400 \end{array}$$

4. The product of 3×751 is _____.

In box D, $300 \times 751 =$ _____ hundreds,

or _____.

D

$$\begin{array}{r} 751 \\ \times\ 300 \\ \hline 225{,}300 \end{array}$$

Multiply in rows 5 to 8.

	a	b	c
5.	$\begin{array}{r} 845 \\ \times\ 300 \\ \hline \end{array}$	$\begin{array}{r} 706 \\ \times\ 400 \\ \hline \end{array}$	$\begin{array}{r} 937 \\ \times\ 200 \\ \hline \end{array}$
6.	$\begin{array}{r} 473 \\ \times\ 500 \\ \hline \end{array}$	$\begin{array}{r} 869 \\ \times\ 700 \\ \hline \end{array}$	$\begin{array}{r} 406 \\ \times\ 800 \\ \hline \end{array}$
7.	$\begin{array}{r} 809 \\ \times\ 400 \\ \hline \end{array}$	$\begin{array}{r} 618 \\ \times\ 900 \\ \hline \end{array}$	$\begin{array}{r} 853 \\ \times\ 600 \\ \hline \end{array}$
8.	$\begin{array}{r} 907 \\ \times\ 700 \\ \hline \end{array}$	$\begin{array}{r} 649 \\ \times\ 500 \\ \hline \end{array}$	$\begin{array}{r} 754 \\ \times\ 900 \\ \hline \end{array}$

9. If there are 150 paper clips in 1 box, how many are there

a. in 3 boxes? _____

b. in 30 boxes? _____

c. in 300 boxes? _____

10. A small box of pencils holds 12 pencils. How many pencils are there

a. in 5 boxes? _____

b. in 500 boxes? _____

Using Three-Place Multipliers

A **Long Way**

$$\begin{array}{r} 157 \\ \times\ 243 \\ \hline 471 \\ 6\,280 \\ 31\,400 \\ \hline 38{,}151 \end{array}$$

One's product 157 × 3 = 471

Ten's product 157 × 40 = 6,280

Hundred's product 157 × 200 = 31,400

Sum of partial products

To multiply by 243, we use it in parts. 243 = 3 ones, 4 tens, and 2 hundreds.

B **Short Way**

$$\begin{array}{r} 157 \\ \times\ 243 \\ \hline 471 \\ 6\,28 \\ 31\,4 \\ \hline 38{,}151 \end{array}$$

Notice how we shorten the work in Ex. B. But we are careful to write the 8 of 628 in ten's column and the 4 of 314 in hundred's column.

The right-hand figure of each partial product is written in the same column as the figure we are multiplying by.

Study boxes A and B. Then finish the products in row 1.

	a	b	c	d	e
1.	247	608	196	187	$2.64
	× 359	× 245	× 327	× 439	× 287
	2223	3040	1372	1683	1848
	------50	-----320	----20	---61	---112
	-----100	-----1600	---8800	---48	---28
					$---57.68

Find products in row 2. Show all the zeros in partial products, as in box A.

2.	675	287	198	$2.09	$2.76
	× 143	× 234	× 263	× 358	× 453

Find products in row 3 the short way, as in box B.

3.	387	459	604	$7.58	$1.97
	× 256	× 137	× 296	× 634	× 328

Don't Let Zeros in Multiplication Trick You!

A

458
× 230
13 740 *one's and ten's products*
91 6 *hundred's product*
105,340

The one's product is 0 × 458, or 0. We must write this 0 because it is a place-holder.

B

364
× 209
3 276 *one's product*
72 8 *hundred's product*
76,076

The ten's product is zero. We need not write it if we write the 8 of 728 in hundred's column.

C

735
× 624
2 940 *one's product*
14 70 *ten's product*
441 0 *hundred's product*
458,640

We must write all the zeros. Each one is a part of a product.

Study boxes A to C. Then finish the products in row 1.

	a	b	c	d	e
1.	679 × 340	708 × 405	340 × 250	$8.50 × 608	500 × 800
	------- 60	----- 40	--- 7000	--- 800	----- 0000
	----- 37	----- 32	--- 80	--- 100	
				-------- 8.00	

Find the products in rows 2 and 3.

2.	758 × 270	905 × 306	$5.90 × 460	$7.90 × 308	900 × 400
3.	968 × 375	280 × 600	$5.07 × 903	$8.70 × 204	700 × 600

4. Fred's father sold 130 bushels of apples at $2.25 a bushel. How much did he receive for them?

---

5. For 90 bu. of peaches Fred's father received a total of $270. This was how much a bushel?

Testing What You Have Learned

[*Cumulative Review*]

For Ex. 1–5, use the numbers in the box.

$\frac{5}{6}$ $1\frac{7}{8}$ $\frac{11}{6}$ $\frac{4}{5}$ $2\frac{1}{4}$ $\frac{5}{2}$

1. Circle two mixed numbers.

2. Put a box around each of two proper fractions.

3. Copy two improper fractions and change them to mixed numbers.

---

4. Copy two fractions which have $\frac{1}{6}$ as fractional unit.

---

5. Copy two fractions which have 5 as numerator.

---

6. Write the sum of $\frac{3}{8}$ and $\frac{5}{8}$. _____

7. $\frac{7}{10}$ is how much less than 1? _____

For Ex. 8 to 17, write the missing numbers. Do the work in your head.

8. 280 = _____ 70's

9. 320 = _____ 8's

10. 460 = _____ 10's

11. 45 ÷ 6 = _____, R_____; so 450 ÷ 60 = _____, R_____

12. 420 ÷ n = 60 n = _____

13. 350 ÷ n = 7 n = _____

14. n ÷ 40 = 6 n = _____

15. 70 × n = 560 n = _____

16. n × 9 = 720 n = _____

17. n = 6 × 400 n = _____

How Accurate Are You?

Do what the signs tell you to do.

	a	b	c	d	e
1.	$63\overline{)298}$	$\$48.02$ $-\ 38.17$	$83\overline{)700}$	9 $-\ 4\frac{2}{3}$	$3\frac{7}{10}$ $+\ 2\frac{9}{10}$
2.	$86\overline{)548}$	157 $\times\ 243$	508 $\times\ 740$	$4\frac{3}{8}$ $1\frac{1}{8}$ $+\ 6\frac{5}{8}$	$7\frac{1}{4}$ $-\ 2\frac{3}{4}$

How Well Can You Estimate?

For Ex. 1, decide which is more, 6×87 or 540. Circle whichever you think is more. Work the same way for Ex. 2 to 8. Do not write in the boxes now.

	a	b	
1.	6×87	**540**	
2.	9×58	**500**	
3.	8×195	**1,600**	
4.	$380 \div 40$	**10**	
5.	$435 \div 60$	**6**	
6.	$704 \div 80$	**9**	
7.	$\frac{1}{8}$ of \$89.92	**\$10**	
8.	$\frac{1}{5}$ of \$90.25	**\$20**	

Now find exact answers for column **a**. Write them in the boxes.

For Ex. 9 to 11, circle the answer that is nearest to the exact answer. Use rounded numbers.

9. A television set is on sale for \$199.95. The regular price is \$280.75. How much can you save by buying the set while it is on sale?

\$100; \$80; \$180

10. Mr. Lee bought the set for \$199.95 and paid for it in 5 equal payments. How much was each payment?

\$20; \$30; \$40

11. What is the sum of 1,896; 2,045; and 2,978?

5,000; 6,000; 7,000

Now find exact answers for Ex. 9 to 11 and write them in the boxes.

How Sharp Are You at Finding Mistakes?

Put an X on each of the four examples below that have wrong answers. Copy in the boxes and work correctly the examples you mark wrong.

1.
$$\begin{array}{r} 6,\text{ R2} \\ 78\overline{)470} \\ \underline{468} \\ 2 \end{array}$$

2.
$$\begin{array}{r} 6{,}012 \\ -\ 3{,}874 \\ \hline 2{,}148 \end{array}$$

3.
$$\begin{array}{r} 349 \\ \times\ 706 \\ \hline 2\,094 \\ 24\,43 \\ \hline 26{,}524 \end{array}$$

4.
$$\begin{array}{r} 7 \\ 94\overline{)668} \\ \underline{668} \end{array}$$

5.
$$\begin{array}{r} 387 \\ \times\ 129 \\ \hline 2\,883 \\ 7\,74 \\ \hline 38\,7 \\ \hline 48{,}323 \end{array}$$

How Good Are You at Solving Problems?

Do your work for these problems on another sheet of paper. Write your answers on the lines after the problems.

1. The attendance at three ball games is given in the box. What was the average attendance at a game?

Game	Attendance
1st	992
2d	670
3d	864

---

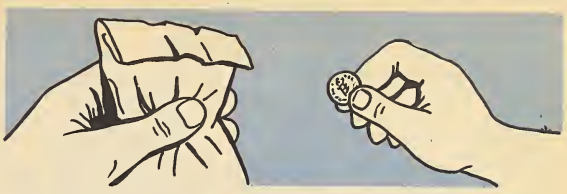
2. Tickets for each game sold for 35¢ each. How much was taken in at each game?

1st_____ 2d_____ 3d_____

3. How many rows of seats with 32 in a row are needed to seat

288 people? _____ 192 people? _____

4. At one game, the peanut man sold 45 lb. of peanuts in 6-ounce bags. How many bags of peanuts did he sell?



5. How much did the man receive when he sold 80 bags at 10¢ a bag?

---

6. At another game, a man sold 97 hot dogs at 25¢ each. How much did he take in?

---

7. George bought a ticket to the game for 35¢, a hot dog for a quarter, and a bag of peanuts for a dime. How much did he have left from a dollar?

---

8. If half of the people attending each game were children, what was the total number of children attending all the games?

How Well Can You Change Measures?

Write the missing numbers. Show your thinking for each example.

		What you think
1.	18 ft. = _____ yd.	18÷3=6
2.	2 hr. = _____ min.	2×60=120
3.	5 gal. = _____ qt.	
4.	$\frac{1}{3}$ yd. = _____ in.	
5.	6 wk. = _____ da.	
6.	$\frac{1}{4}$ hr. = _____ min.	
7.	8 cups = _____ pt.	
8.	5 ft. = _____ in.	
9.	36 qt. = _____ gal.	
10.	8 yd. = _____ ft.	
11.	8 doz. = _____ things	
12.	180 min. = _____ hr.	
13.	$\frac{1}{3}$ doz. = _____ things	

5 Some Important Understandings in Division

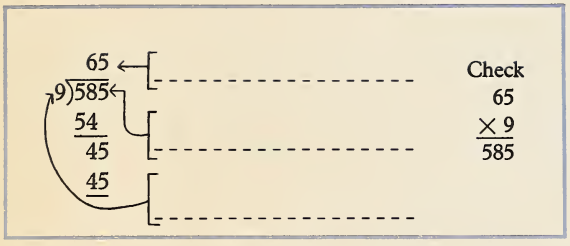
[*Readiness for 2-place divisors*]



1. Nine ushers at a school play are to give out 585 programs. If the programs are divided equally, what fractional part will each usher have?

---

2. How many programs will each usher have? (See the box.)



3. In the box, label the dividend, the divisor, and the quotient. Then answer these questions about the numbers:

a. What do we call the number that tells how many things there are in a large group that is to be divided into equal smaller groups?

---

b. What do we call the number that tells how many equal groups to make?

---

c. What do we call the number that tells how many things there are in each equal group?

---

4. To check a division example (as in the box), we multiply the _____ and the _____. The product should equal the _____.

5. For $9\overline{)585}$, the first partial dividend is 58 tens. When we know this, we know the place where we must write the first quotient figure. The 6 of the quotient is in what place?

We write a figure in the quotient for each partial dividend.

Before dividing in row 6, put a tiny x to show where each quotient figure is to go.

	a	b	c
6.	$7\overline{)735}$	$8\overline{)5,984}$	$4\overline{)9,600}$

Divide in row 7. Watch zeros in the quotients.

7.	$6\overline{)3,000}$	$6\overline{)5,454}$	$8\overline{)7,536}$

Estimating Quotients

[*Readiness for 2-place divisors*]

In Ex. 1 at the right, each tiny x shows where a quotient figure is needed. After the first quotient figure is placed, we can estimate the whole quotient.

The first quotient figure is 6. It belongs in hundred's place, so we know the quotient will be larger than 600 but smaller than 700.

For Ex. 2 to 6, use a tiny x to locate each quotient figure. Then estimate each whole quotient as was done for Ex. 1.

In rows 7 and 8, *think* the estimate for each quotient before you divide. Then do the dividing.

		Estimated Quotient	
		Larger than	Smaller than
1.	$8\overline{)4,939}$ (x x x)	600	700
2.	$7\overline{)9,356}$		
3.	$5\overline{)1,906}$		
4.	$3\overline{)8,759}$		
5.	$9\overline{)\$5.87}$	$0.60	
6.	$9\overline{)9,279}$		

	a	b	c	d	e
7.	$8\overline{)\$60.32}$	$9\overline{)7,564}$	$8\overline{)6,525}$	$4\overline{)\$83.45}$	$8\overline{)996}$
8.	$9\overline{)842}$	$8\overline{)\$44.78}$	$5\overline{)9,075}$	$7\overline{)\$9.37}$	$6\overline{)5,730}$

Check your work for row 8.

Two-Place Divisors and Two-Place Quotients

1. $992 \div 31 = ?$ (Box A) The first partial dividend is 99 (tens), so there will be quotient figures in ten's place and in one's place.

A **Locate the quotient figures:**

$$31\overline{)992}$$

(xx)

First Partial Dividend (Box B)

Divide tens. $99 \div 31$ = _____. Write "3" in the quotient in _____ place.

B **Divide tens:**

$$\begin{array}{r} 3 \\ 31\overline{)992} \\ 93 \\ \hline 62 \end{array}$$

(xx)

Estimate

$$30\overline{)90}\ 3$$

Multiply and compare. 3 (tens) $\times$ 31 = _____ (tens). Can 93 (tens) be subtracted from 99 (tens)? _____

C **Divide ones:**

$$\begin{array}{r} 32 \\ 31\overline{)992} \\ 93 \\ \hline 62 \\ \underline{62} \end{array}$$

(xx)

Estimate

$$30\overline{)60}\ 2$$

Subtract and compare. $99 - 93$ = _____. Is the remainder number, 6, smaller than the divisor, 31? _____

Bring down the 2 ones to make _____ ones for the second partial dividend.

Second Partial Dividend (Box C)

Divide ones. $62 \div 31$ = _____.

Multiply, compare, and subtract just as you did when you divided tens.

Is there a remainder? _____

[*3-place dividends*]

Finish the examples in rows 2 and 3.

	a	b
2.	21, R____ (xx) $42\overline{)886}$ 84 46 42	21, R____ (xx) $45\overline{)948}$ 90 48
3.	3 R____ (xx) $21\overline{)695}$ 63 65	1 R____ (xx) $32\overline{)395}$ 32 7

Divide in rows 4 to 6.

4.	$61\overline{)795}$	$30\overline{)375}$
5.	$43\overline{)951}$	$34\overline{)386}$
6.	$45\overline{)990}$	$54\overline{)596}$

Can You Divide Four-Place Dividends?

1. $2{,}748 \div 61 = ?$ (Box A) The first part of the dividend that can be divided by 61 is 274 (tens). Then the quotient will have figures in ten's place and in one's place.

A **Locate the quotient figures:**

$$61\overline{)2{,}748}$$
xx

B **Divide tens:**

$$\begin{array}{r} 4 \\ \text{xx} \\ 61\overline{)2{,}748} \\ 244 \\ \hline 308 \end{array}$$

Think this: $4 + 60\overline{)270}$

C **Divide ones:**

$$\begin{array}{r} 45, \text{R3} \\ \text{xx} \\ 61\overline{)2{,}748} \\ 244 \\ \hline 308 \\ 305 \\ \hline 3 \end{array}$$

Think this: $5 + 60\overline{)300}$

First Partial Dividend (Box B)

Divide tens. $274 \div 61$ (or about $270 \div 60$) = _____. The whole quotient will be between 40 and _____.

Multiply and compare. 4 (tens) × 61 = _____ (tens). Is 244 (tens) less than 274 (tens)? _____

Subtract and compare. 274 — 244 = _____. Is the remainder number smaller than the divisor? _____

Bring down the 8 ones to make 308 for the second partial dividend.

Second Partial Dividend (Box C)

Use again the steps that you used for the first partial dividend.

The final remainder is _____.

[*No carrying or borrowing*]

Finish the examples in rows 2 and 3.

	a	b
2.	$\begin{array}{r} 2 \\ \text{xx} \\ 81\overline{)1{,}869} \\ 162 \\ \hline 249 \end{array}$	$\begin{array}{r} 2 \\ \text{xx} \\ 51\overline{)1{,}132} \\ 102 \\ \hline 112 \end{array}$
3.	$\begin{array}{r} 2 \\ \text{xx} \\ 52\overline{)1{,}096} \\ 104 \\ \hline \end{array}$	$\begin{array}{r} \\ \text{xx} \\ 40\overline{)2{,}653} \\ 240 \\ \hline \end{array}$

Divide in rows 4 to 6.

4.	$42\overline{)1{,}386}$	$71\overline{)1{,}645}$
5.	$62\overline{)1{,}998}$	$82\overline{)1{,}897}$
6.	$73\overline{)1{,}699}$	$52\overline{)2{,}298}$

Watch for Carrying in the Multiplication Step

[No borrowing in subtraction step]

If estimating quotient figures is hard for you, you can write your estimates neatly as side work.

A

$$\begin{array}{r} 54,\ \text{R5} \\ \times\times \\ 83\overline{)4,487} \\ 4\ 15 \\ \hline 337 \\ 332 \\ \hline 5 \end{array}$$

Estimates

$$\begin{array}{r} 5\ + \\ 80\overline{)440} \end{array}$$

$$\begin{array}{r} 4\ + \\ 80\overline{)330} \end{array}$$

B

Check

$$\begin{array}{r} 83 \\ \times\ 54 \\ \hline 332 \\ 4\ 15 \\ \hline 4,482 \\ +\ 5 \\ \hline 4,487 \end{array}$$

1. Box A. To estimate the ten's quotient figure, *think*: "There are probably as many 83's in 448 as there are 80's in 440. $440 \div 80 = 5$ and a remainder, so the estimated quotient figure is 5."

To test your estimate, multiply 83 by 5.

To estimate the one's quotient figure, *think*, "80's in $330 = 4$ and a remainder, so 4 is the estimate."

Then multiply 83 by _____.

2. Study the check in box B and find the correct numbers to fill these blanks:

four 83's = _____; fifty 83's = _____ tens,

or _____; fifty-four 83's = _____.

In box B, the product plus the remainder equals the dividend in box A.

Divide and check in Ex. 3 to 8.

3. $62\overline{)3,348}$

4. $93\overline{)6,894}$

5. $53\overline{)3,396}$

6. $73\overline{)6,799}$

7. $72\overline{)4,897}$

8. $65\overline{)3,976}$

Borrowing in the Subtraction Step

[*No carrying in multiplication step*]

Divide in rows 1 to 5. Write the estimating steps for each example, as in box A, page 84.

	a	b	c
1.	$93\overline{)2,158}$	$63\overline{)2,113}$	$82\overline{)3,621}$
2.	$52\overline{)2,203}$	$73\overline{)2,365}$	$71\overline{)4,500}$
3.	$42\overline{)1,026}$	$54\overline{)1,160}$	$81\overline{)6,832}$
4.	$83\overline{)2,704}$	$93\overline{)2,980}$	$91\overline{)6,825}$
5.	$72\overline{)3,168}$	$62\overline{)1,430}$	$81\overline{)5,544}$

Practice in Multiplication and Division

Do you make mistakes in the multiplication step of a division example? The exercises below will give you practice in writing products.

Multiply each number in column a by 7; each number in column b by 8; and so on. If any of the facts are hard for you, make a list and study them.

	a Multiply by 7	b Multiply by 8	c Multiply by 9	d Multiply by 6
1.	56 _____	64 _____	24 _____	58 _____
2.	38 _____	39 _____	53 _____	47 _____
3.	49 _____	75 _____	67 _____	95 _____
4.	27 _____	82 _____	89 _____	28 _____
5.	98 _____	56 _____	36 _____	36 _____

Divide in rows 6 and 7. Watch for both carrying and borrowing.

	a	b	c	d
6.	$63\overline{)2,715}$	$84\overline{)5,400}$	$65\overline{)2,243}$	$73\overline{)6,862}$
7.	$42\overline{)1,974}$	$53\overline{)4,936}$	$62\overline{)5,231}$	$93\overline{)8,835}$

Dividing Money Numbers



1. Jean and Mary saved their money for a year to buy the bunk bed in the picture. What was the average amount saved per week? (Remember: 1 year = 52 weeks.) Finish the work in box A below.

A

$$52\overline{)\$37.44} \quad \$0.7$$
$$364$$
$$104$$
$$104$$

B

$$42\overline{)\$35.30} \quad \$0.\ ,\ R\ \text{¢}$$
$$336$$
$$170$$
$$168$$
$$2$$

2. After saving his money for 42 weeks, Tom had saved $35.30 to buy a bicycle. What average amount per week had Tom saved? Finish the work in box B.

The remainder, 2¢, in box B means that Tom averaged slightly more than 84¢ a week for 42 weeks.

Divide in rows 3 to 5. In money numbers, be sure to put the decimal point in the quotient right above the decimal point in the dividend.

	a	b
3.	$73\overline{)\$62.78}$	$64\overline{)3,351}$
4.	$72\overline{)\$18.00}$	$94\overline{)8,600}$
5.	$83\overline{)\$21.64}$	$75\overline{)\$40.50}$

The Signs Tell You What to Do

1. 894×37

2. $4\frac{5}{16} + 2 + 16\frac{7}{16} + 2\frac{1}{16}$

3. 608×390

4. $\$90.00 - 56.43$

5. $\$7.90 \times 408$

6. $7\frac{1}{8} + 8\frac{3}{8} + 15\frac{7}{8} + 4\frac{3}{8}$

Watch Zero as a Quotient Figure

1. A store sold oranges in bags of 24. How many bags could be filled from 973 oranges?

Box A. The second partial dividend, 13 ones, cannot be divided by 24, so we must write a zero in one's place in the quotient.

A

$$24\overline{)973}\quad 40,\ \text{R}13$$
$$96$$
$$13$$

_____ bags can be filled, and _____ oranges will be left over.

2. Betty paid $1.68 to have 21 snapshots printed. Each snapshot cost how much? (Box B)

_____

We write zeros in dollar's place and dime's place to show that the quotient means 8 cents.

B

$$21\overline{)\$1.68}\quad \$0.08$$
$$1\,68$$

Divide in rows 3 to 7.

	a	b
3.	$68\overline{)\$27.20}$	$64\overline{)\$5.76}$
4.	$76\overline{)2,295}$	$86\overline{)4,306}$
5.	$7\overline{)\$71.89}$	$54\overline{)\$8.10}$
6.	$96\overline{)\$13.44}$	$83\overline{)7,860}$
7.	$78\overline{)\$5.46}$	$92\overline{)\$73.64}$

Find answers for problems 8 to 11.

8. When Betty paid $1.68 for her pictures, how much change did she get from a $5 bill?

_____

9. At 32¢ a gallon, what would 7 gal. of gasoline cost?

_____

10. If a car averages 48 miles an hour, how far will it travel in 15 hours?

_____

11. A bus that averages 43 miles an hour would take how many hours to travel 860 miles?

_____





A Spring Festival at Duncan School

[*M. and D. problems*]

Read each problem to decide whether you will multiply or divide. Then work the problems and write your answers on the lines.

1. The Duncan School is having a spring festival. The girls in the cooking class made 528 stuffed dates. If they pack them 24 to a box, how many boxes will they fill?

---

2. If they pack caramels in boxes of 20 each, how many boxes will they need for 250 caramels?

Will any of the caramels be left over?

How many? ---

3. For the festival, the milkman delivered 15 cases of milk. There are 24 bottles of milk in each case. How many bottles of milk did the milkman bring?

---

4. If the bottles in Ex. 3 were half-pint bottles, how many quarts of milk were delivered?

---

5. The school wants 768 cupcakes. How many trays with 32 cupcakes on a tray should the baker deliver?

---

6. Thirty-six girls made a total of 504 paper flowers to decorate the booths. What was the average number of flowers made by a girl?

---

7. If the girls use the 504 flowers to decorate 8 booths, how many flowers can they use for a booth?

---

8. Thirty-two boys printed 900 tickets for the festival. How many did each boy have to print?

How many boys had to print an extra ticket?

---

9. Look at the ticket in the picture below. If all the 900 tickets are sold, how much money will the school take in?



Division Practice

	a	b	c	d
1.	$8\overline{)320}$	$7\overline{)5,954}$	$9\overline{)9,279}$	$7\overline{)9,107}$
2.	$36\overline{)792}$	$25\overline{)577}$	$81\overline{)3,678}$	$52\overline{)1,788}$
3.	$92\overline{)4,784}$	$32\overline{)2,698}$	$94\overline{)1,252}$	$54\overline{)4,490}$
4.	$95\overline{)6,940}$	$81\overline{)\$67.25}$	$43\overline{)1,505}$	$93\overline{)\$31.32}$
5.	$93\overline{)\$39.06}$	$44\overline{)3,582}$	$85\overline{)\$12.83}$	$74\overline{)\$38.53}$

1. In circle A, the colored $\frac{1}{4}$ is divided into _____ equal pieces.

A



If each $\frac{1}{4}$ were divided in the same way, there would be 12 equal pieces in the whole circle. The 3 pieces in $\frac{1}{4}$ of the circle equal $\frac{3}{12}$.

When we change $\frac{1}{4}$ to $\frac{3}{12}$, we get _____ times as many parts, but each part is only $\frac{1}{3}$ as large.

B

$$\frac{3 \times 1}{3 \times 4} = \frac{3}{12} \qquad \frac{3 \div 3}{12 \div 3} = \frac{1}{4}$$

2. Box B. To change $\frac{1}{4}$ to $\frac{3}{12}$, we **multiply** the numerator, 1, and the denominator, 4 (called the terms of the fraction $\frac{1}{4}$), by _____.

3. Box B. When we change $\frac{3}{12}$ to $\frac{1}{4}$, we do just the opposite.

We **divide** both terms of $\frac{3}{12}$ by _____.

4. In circle C, $\frac{1}{5} = \frac{\quad}{10}$.

C



5. Box D. To change $\frac{1}{5}$ to $\frac{2}{10}$, we multiply both terms of $\frac{1}{5}$ by _____.

6. Box D. To change $\frac{2}{10}$ to $\frac{1}{5}$, we divide both terms of $\frac{2}{10}$ by _____.

D

$$\frac{2 \times 1}{2 \times 5} = \frac{2}{10} \qquad \frac{2 \div 2}{10 \div 2} = \frac{1}{5}$$

Then we have half as many parts, but each part is twice as large.

The work above illustrates the Golden Rule of Fractions, given at the top of the next column.

Multiplying or dividing both terms of a fraction by the same number changes the form but not the value of the fraction.

We use this rule when we change fractions to higher or to lower terms.

E

$$\frac{2}{5} = \frac{?}{15} \qquad \frac{3 \times 2}{3 \times 5} = \frac{\quad}{15}$$

7. Box E. To change $\frac{2}{5}$ to fifteenths, *think*, "The denominator 5 must be multiplied by 3 to get 15. We must multiply the numerator 2 (of $\frac{2}{5}$) by 3 also." Finish the work in box E.

F

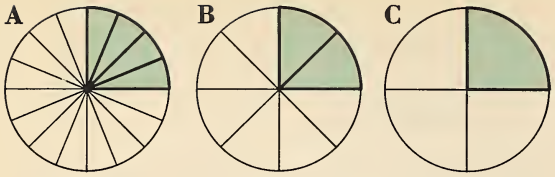
$$\frac{15}{20} = \frac{?}{4} \qquad \frac{15 \div 5}{20 \div 5} = \frac{\quad}{4}$$

8. Box F. To change $\frac{15}{20}$ to fourths, divide both terms by 5. Finish the work.

Write the missing numbers below.

	a	b
9.	$\frac{\times 4}{\times 5} = \frac{\quad}{10}$	$\frac{\times 5}{\times 8} = \frac{\quad}{16}$
10.	$\frac{\times 2}{\times 3} = \frac{\quad}{12}$	$\frac{\times 3}{\times 4} = \frac{\quad}{8}$
11.	$\frac{8 \div}{10 \div} = \frac{\quad}{5}$	$\frac{10 \div}{12 \div} = \frac{\quad}{6}$
12.	$\frac{14 \div}{16 \div} = \frac{\quad}{8}$	$\frac{9 \div}{12 \div} = \frac{\quad}{4}$
13.	$\frac{8 \div}{12 \div} = \frac{\quad}{3}$	$\frac{5 \div}{10 \div} = \frac{\quad}{2}$
14.	$\frac{\times 1}{\times 3} = \frac{\quad}{12}$	$\frac{\times 3}{\times 8} = \frac{\quad}{16}$

Can You Reduce Fractions to Lowest Terms?



The green parts of these circles are equal. The circles show that $\frac{4}{16} = \frac{2}{8} = \frac{1}{4}$.

1. To reduce $\frac{4}{16}$ to lower terms, we could divide both terms by 2. $\frac{4}{16} = \frac{2}{8}$. Can we reduce $\frac{2}{8}$ to lower terms?

$$\frac{2 \div 2}{8 \div 2} = \text{—}$$

We say that $\frac{1}{4}$ is in **lowest terms** because the only number that will divide both terms evenly is 1.

2. To reduce $\frac{4}{16}$ to lowest terms in one step, we divide both terms by _____.

When a fraction is in lowest terms, it has the smallest numbers possible for its terms.

Reduce to lowest terms all the fractions below which can be reduced. Each time, show the number by which you divided both terms. Ex. 3a is done for you.

	a	b
3.	$\frac{6}{9} = \frac{6 \div 3}{9 \div 3} = \frac{2}{3}$	$\frac{8}{20} =$
4.	$\frac{14}{20} =$	$\frac{15}{24} =$
5.	$\frac{9}{18} =$	$\frac{7}{10} =$
6.	$\frac{13}{20} =$	$\frac{3}{15} =$
7.	$\frac{16}{24} =$	$\frac{6}{16} =$
8.	$\frac{7}{8} =$	$\frac{8}{10} =$

Are You Quick in Estimating Products?

George estimates products by thinking what numbers they are between. For 8×57, he *thinks*, "The product is more than 400 (8×50) but less than 480 (8×60). The product is closer to 480, because 57 is closer to 60 than to 50."

Estimate products for Ex. 1 to 3 in George's way.

	Larger than	Smaller than	Closer to
1. 6×87 is	_____	_____	_____
2. 5×33 is	_____	_____	_____
3. 9×39 is	_____	_____	_____

In each pair below, circle the one that is larger. Use George's way of thinking if you need help.

4. 7×87 or 630

5. 9×54 or 450

6. 6×38 or 240

7. 9×47 or 360

8. 6×93 or 540

9. 8×34 or 320

Now try Ex. 10 to 12. Circle whichever is larger, just as you did above.

10. Which is larger, 7×69 or 496?

11. Which is larger, 4×73 or 283?

12. Which is larger, 6×56 or 358?

Fractional Parts of Groups and of Measures

What fractional part of each group of marbles is colored? Look at each picture; then write the missing numerators in the last column.

		Colored	Part of All
1.		1	$\frac{1}{8}$
2.		2	$\frac{2}{8}$, or $\frac{\quad}{4}$
3.		3	$\frac{\quad}{8}$
4.		4	$\frac{\quad}{8}$, or $\frac{\quad}{2}$
5.		5	$\frac{\quad}{8}$
6.		6	$\frac{\quad}{8}$, or $\frac{\quad}{4}$
7.		7	$\frac{\quad}{8}$
8.		8	$\frac{\quad}{8}$, or all

What fractional part of a day (24 hr.) is each number of hours in Ex. 9 to 15?

	Number of Hours	Part of a Day
9.	1	$\frac{1}{24}$
10.	3	$\frac{\quad}{24}$, or $\frac{\quad}{8}$
11.	4	$\frac{\quad}{24}$, or $\frac{\quad}{6}$
12.	6	$\frac{\quad}{24}$, or _____
13.	8	_____, or _____
14.	12	_____, or _____
15.	18	_____, or _____

What fractional part of 16 balloons are

16. 8 balloons? _____

17. 6 balloons? _____

18. 4 balloons? _____

19. 3 balloons? _____

20. 2 balloons? _____

In each pair, circle the one that is more. Write what you think to decide.

	Which Is More?	Your Thinking
21.	$\frac{1}{2}$ yd. or (20 in.)	$\frac{1}{2}$ yd. = 18 in.
22.	$\frac{3}{4}$ hr. or 40 min.	_____
23.	$\frac{1}{2}$ gal. or 3 qt.	_____
24.	$\frac{1}{2}$ lb. or 7 oz.	_____
25.	$\frac{3}{4}$ yd. or 24 in.	_____
26.	$\frac{5}{6}$ ft. or 11 in.	_____
27.	$\frac{1}{2}$ hr. or 25 min.	_____

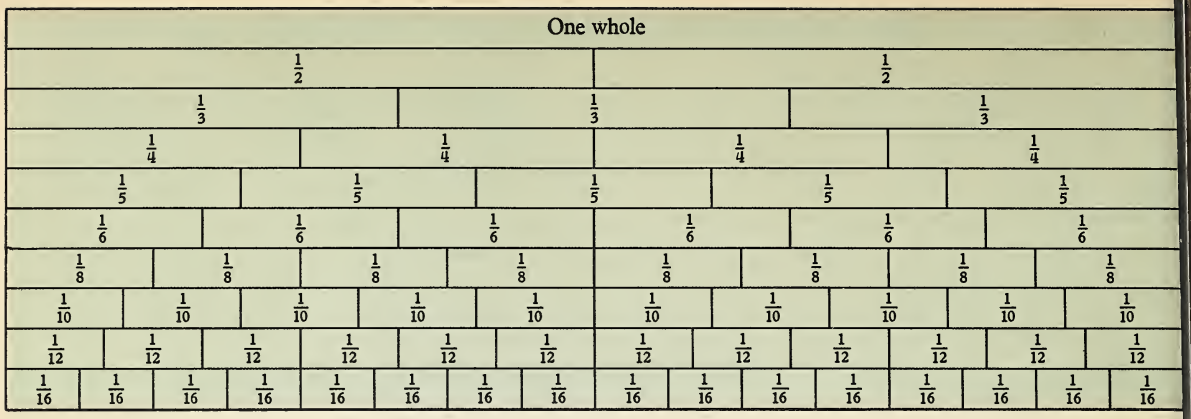
Write the missing numbers below.

28. $1\frac{1}{4}$ $1\frac{1}{2}$ $1\frac{3}{4}$ _____ _____ $2\frac{1}{2}$

29. 4 $3\frac{4}{5}$ $3\frac{3}{5}$ _____ _____ 3

30. $1\frac{1}{2}$ $1\frac{5}{8}$ $1\frac{3}{4}$ _____ _____ $2\frac{1}{8}$

31. $7\frac{1}{2}$ $9\frac{1}{2}$ $11\frac{1}{2}$ _____ _____ $17\frac{1}{2}$



Studying Related Fractions

Use the diagram above or use the Golden Rule of Fractions to help you write the missing numerators:

1. $\frac{1}{2} = \frac{\quad}{4} = \frac{\quad}{6} = \frac{\quad}{8} = \frac{\quad}{10} = \frac{\quad}{12} = \frac{\quad}{16}$

2. $\frac{1}{3} = \frac{\quad}{6} = \frac{\quad}{12}$ $\qquad \frac{2}{3} = \frac{\quad}{12}$

3. Can you change $\frac{1}{2}$ to thirds? _____

The diagram shows that $\frac{1}{2}$ is more than $\frac{1}{3}$ but less than $\frac{2}{3}$. The denominator 3 cannot be divided evenly by the denominator 2.

4. Can you change $\frac{1}{2}$ to fifths? _____

Can you divide 5 by 2 evenly? _____

Because we can change halves to fourths, sixths, eighths, tenths, and so on, we say that halves are **related** to fourths, sixths, eighths, tenths, and so on. But halves are not related to thirds, fifths, sevenths, ninths, and so on.

If the denominator of one fraction can be divided evenly by the denominator of another fraction, then the two fractions are related.

5. Which fraction has the greater value, $\frac{3}{5}$ or $\frac{7}{10}$? (Look at the chart to decide.) _____

6. Are the fractions $\frac{3}{5}$ and $\frac{7}{10}$ like or unlike? _____ Are they related or unrelated? _____

We can change fifths to tenths. Then we have like-fractions and can tell without looking at the chart that $\frac{7}{10}$ has greater value than $\frac{3}{5}$, or $\frac{6}{10}$.

In each pair, circle the fraction with the greater value. Show the change you made in one fraction to help you decide.

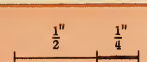
Which Is Larger?	Change in Fraction
7. $\frac{2}{3}$ or $\frac{7}{12}$	$\frac{2}{3} = \frac{8}{12}$
8. $\frac{5}{8}$ or $\frac{3}{4}$	
9. $\frac{3}{4}$ or $\frac{9}{16}$	
10. $\frac{4}{5}$ or $\frac{9}{10}$	
11. $\frac{7}{8}$ or $\frac{13}{16}$	
12. $\frac{11}{12}$ or $\frac{5}{6}$	

Adding Unlike-Fractions

[*Related fractions*]

1. To find the total length of the lines in box A, we need to add $\frac{1}{2}$ inch and $\frac{1}{4}$ inch.

A



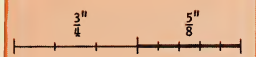
Are $\frac{1}{2}$ and $\frac{1}{4}$ like-fractions? _____

Are they related fractions? _____

To add $\frac{1}{2}$ and $\frac{1}{4}$, we think of $\frac{1}{2}$ as $\frac{2}{4}$. Then we add the like-fractions $\frac{2}{4}$ and $\frac{1}{4}$. The sum is $\frac{3}{4}$. To check, use your ruler.

2. Box B. Before we can add $\frac{3}{4}$ and $\frac{5}{8}$, we must change _____ to _____.

B



$\frac{3}{4} = \frac{6}{8}$

$+\frac{5}{8} = \frac{5}{8}$

$\frac{11}{8} = 1\frac{3}{8}$

3. Box C. Which has the smaller fractional unit, $\frac{5}{16}$ or $\frac{7}{8}$?

_____

C

$\frac{5}{16} = \frac{5}{16}$

$+\frac{7}{8} = \frac{14}{16}$

$\frac{19}{16} = 1$ —

Can we change $\frac{7}{8}$ to sixteenths? _____

Finish the work in box C.

In box C, after $\frac{7}{8}$ is changed to $\frac{14}{16}$, the denominator 16 is **common** to both fractions. This means that both fractions have the **common** fractional unit $\frac{1}{16}$.

4. In Ex. 1, the common fractional unit is $\frac{1}{4}$. The common denominator is _____.

5. In box B, the common fractional unit is _____. The common denominator is _____.

6. In Ex. 1 to 3, which fraction was changed, the fraction with the smaller fractional unit or the one with the larger fractional unit?

_____

Which fraction would you change, and how would you change it, to add in Ex. 7 to 11?

7. $\frac{1}{4} + \frac{1}{12}$ Change $\frac{1}{4}$ to $\frac{3}{12}$

8. $\frac{1}{6} + \frac{1}{3}$ Change _____

9. $\frac{7}{10} + \frac{1}{5}$ Change _____

10. $\frac{1}{4} + \frac{1}{16}$ Change _____

11. $\frac{1}{10} + \frac{1}{2}$ Change _____

Finish the additions in Ex. 12 and 13.

12.

$\frac{4}{5} = \frac{8}{10}$

$+\frac{3}{10} = \frac{3}{10}$

$\frac{11}{10} = 1$ —

13.

$\frac{5}{16} = \frac{5}{16}$

$+\frac{3}{4} = \frac{12}{16}$

Find the common denominators and add in Ex. 14 to 18.

14.

$$\begin{array}{r} \frac{7}{10} \\ +\frac{3}{5} \\ \hline \end{array}$$

15.

$$\begin{array}{r} \frac{5}{8} \\ +\frac{1}{2} \\ \hline \end{array}$$

16.

$$\begin{array}{r} \frac{1}{3} \\ +\frac{7}{12} \\ \hline \end{array}$$

17.

$$\begin{array}{r} \frac{3}{4} \\ +\frac{13}{16} \\ \hline \end{array}$$

18.

$$\begin{array}{r} \frac{7}{12} \\ +\frac{1}{2} \\ \hline \end{array}$$

Subtracting Unlike-Fractions

[*Related fractions*

1. Kate had $\frac{7}{8}$ lb. of nut meats. She used $\frac{1}{4}$ lb. in fudge. What part of a pound was left?

Only like-fractions can be subtracted, so we must change $\frac{1}{4}$ to eighths.

A

$$\frac{7}{8} = \frac{7}{8}$$
$$-\frac{1}{4} = \frac{2}{8}$$
$$\frac{5}{8}$$

Study box A. _____ lb. was left.

2. Kate's mother used $\frac{3}{16}$ lb. of the nut meats in a cake. What part of a pound was left then?

Box B. To subtract, we must change $\frac{5}{8}$ to _____.

Finish the work.

B

$$\frac{5}{8} = \frac{10}{16}$$
$$-\frac{3}{16} = \frac{3}{16}$$

Subtract in Ex. 3 to 14. Work carefully!

3. $\frac{7}{12} - \frac{1}{2}$ = _____

4. $\frac{7}{16} - \frac{1}{4}$ = _____

5. $\frac{4}{5} - \frac{7}{10}$ = _____

6. $\frac{3}{4} - \frac{1}{12}$ = _____

7. $\frac{13}{16} - \frac{3}{8}$ = _____

8. $\frac{2}{3} - \frac{7}{12}$ = _____

9. $\frac{9}{10} - \frac{1}{5}$ = _____

10. $\frac{1}{3} - \frac{1}{12}$ = _____

11. $\frac{5}{6} - \frac{2}{3}$ = _____

12. $\frac{15}{16} - \frac{1}{4}$ = _____

13. $\frac{7}{12} - \frac{1}{6}$ = _____

14. $\frac{11}{12} - \frac{2}{3}$ = _____

Making Comparisons with Measures

How much less than

1. a ton is 1,500 lb.? _____

2. an hour is 45 min.? _____

3. a day is 20 hr.? _____

4. a year is 40 wk.? _____

5. 2 gal. is 7 qt.? _____

How much more than

6. a gallon is 6 qt.? _____

7. a dozen is 21 eggs? _____

8. a pound is 20 oz.? _____

9. a yard is 46 in.? _____

10. an hour is 75 min.? _____

Mixed Numbers with Related Fractions

[*No carrying or borrowing*]

A	B
$3\frac{5}{16} = 3\frac{5}{16}$ $+ 2\frac{3}{8} = 2\frac{6}{16}$ 5—	$7\frac{1}{2} = 7\frac{5}{10}$ $- 4\frac{3}{10} = 4\frac{3}{10}$ $3\frac{2}{10} = 3$—

1. Box A. Can we add $\frac{5}{16}$ and $\frac{3}{8}$ without changing one of the fractions?

---

2. Are sixteenths and eighths related?

---

3. In box A we change eighths to sixteenths because eighths are the larger-sized parts. Finish the work.

4. Box B. Look at the fractions to be subtracted. Which are the larger-sized parts, halves or tenths?

---

5. In box B, the common denominator is

---. Finish the work.

Finish the work in row 6. Be sure answers are in best form.

	a	b	c	d
6.	$4\frac{3}{16} = 4\frac{3}{16}$ $+ 5\frac{1}{4} = 5\frac{4}{16}$	$8\frac{2}{3} = 8\frac{8}{12}$ $- 4\frac{7}{12} = 4\frac{7}{12}$	$6\frac{3}{4} = 6\frac{9}{12}$ $+ 2\frac{1}{12} = 2\frac{1}{12}$ $8\frac{10}{12} = 8$—	$2\frac{9}{10} = 2\frac{9}{10}$ $- \frac{2}{5} = \frac{4}{10}$ $2\frac{5}{10} = 2$—

Add or subtract in rows 7 to 9.

7.	$9\frac{3}{5}$ $- 3\frac{3}{10}$	$8\frac{3}{4}$ $- 5\frac{9}{16}$	$5\frac{1}{12}$ $+ \frac{2}{3}$	$9\frac{5}{6}$ $- 2\frac{7}{12}$
8.	$4\frac{7}{16}$ $+ 1\frac{1}{8}$	$9\frac{1}{4}$ $+ 7\frac{5}{16}$	$5\frac{11}{12}$ $- 4\frac{1}{6}$	$5\frac{1}{4}$ $+ 6\frac{5}{12}$
9.	$1\frac{9}{16}$ $- \frac{1}{2}$	$\frac{3}{8}$ $+ 6\frac{1}{2}$	$4\frac{9}{10}$ $- 1\frac{1}{2}$	$5\frac{11}{16}$ $+ 3\frac{1}{8}$

Carrying in the Addition of Mixed Numbers

[*Related fractions*]

1. Study the addition in the box. When we add $\frac{8}{10}$ and $\frac{7}{10}$, we get the improper fraction _____. In best form, $\frac{15}{10}$ = _____.

Finish the work in the box.

$$4\tfrac{4}{5} = 4\tfrac{8}{10}$$
$$+\ 2\tfrac{7}{10} = 2\tfrac{7}{10}$$
$$6\tfrac{15}{10} = 6 + 1\tfrac{1}{2} = \text{\_\_\_\_\_}$$

Side work

$\frac{15}{10} = 1\frac{5}{10} = 1\frac{1}{2}$

Finish the examples in row 2.

a	b	c
2. $7\frac{3}{4} = 7\frac{9}{12}$	$7\frac{11}{16} = 7\frac{11}{16}$	$9\frac{1}{2} = 9\frac{5}{10}$
$+\ 6\frac{5}{12} = 6\frac{5}{12}$	$+\ 2\frac{3}{4} = 2\frac{12}{16}$	$+\ 5\frac{7}{10} = 5\frac{7}{10}$
$13\frac{14}{12} =$		

Add in rows 3 to 6. Show the side work if it helps you.

3. $5\frac{9}{10}$	$8\frac{1}{2}$	$9\frac{15}{16}$
$+\ 6\frac{4}{5}$	$+\ 3\frac{3}{4}$	$+\ 4\frac{3}{8}$
4. $1\frac{7}{12}$	$\frac{5}{6}$	$8\frac{2}{3}$
$+\ \frac{3}{4}$	$+\ 2\frac{11}{12}$	$+\ 1\frac{7}{15}$
5. $4\frac{1}{2}$	$4\frac{3}{10}$	$8\frac{3}{5}$
$+\ 1\frac{11}{12}$	$+\ 6\frac{4}{5}$	$+\ 4\frac{4}{15}$
6. $7\frac{2}{5}$	$4\frac{9}{10}$	$7\frac{11}{16}$
$+\ 5\frac{8}{15}$	$+\ 3\frac{2}{5}$	$+\ 2\frac{3}{8}$

Watch the Borrowing in Subtracting Mixed Numbers

[*Related fractions*]

$6\frac{1}{12} = 6\frac{1}{12} = 5\frac{13}{12}$
$-\ 2\frac{1}{3} = 2\frac{4}{12} = 2\frac{4}{12}$
$3\frac{9}{12} = 3\frac{3}{4}$

Side work
$1 = \frac{12}{12}$
$\frac{1}{12} + \frac{12}{12} = \frac{13}{12}$

1. To subtract $\frac{4}{12}$ from $\frac{1}{12}$, we need more twelfths. We change 1 of the 6 wholes to _____ twelfths. Then $\frac{1}{12} + \frac{12}{12} =$ _____. $5\frac{13}{12} - 2\frac{4}{12} =$ _____. Which is in better form, $3\frac{9}{12}$ or $3\frac{3}{4}$? _____

Write the missing numerators below.

	a	b	c
2.	$3\frac{1}{4} = 2\frac{\quad}{4}$	$5\frac{3}{8} = 4\frac{\quad}{8}$	$3\frac{3}{10} = 2\frac{\quad}{10}$
3.	$8\frac{1}{6} = 7\frac{\quad}{6}$	$4\frac{2}{5} = 3\frac{\quad}{5}$	$8\frac{7}{16} = 7\frac{\quad}{16}$

Finish the examples in rows 4 to 6.

	a	b
4.	$7\frac{1}{8} = 7\frac{1}{8} = 6\frac{9}{8}$ $-\ 3\frac{3}{4} = 3\frac{6}{8} = 3\frac{6}{8}$	$4\frac{1}{16} = 4\frac{1}{16} = 3\frac{17}{16}$ $-\ 3\frac{3}{8} = 3\frac{6}{16} = 3\frac{6}{16}$
5.	$7\frac{1}{2} = 7\frac{3}{6} = 6\frac{9}{6}$ $-\ 3\frac{5}{6} = 3\frac{5}{6} = 3\frac{5}{6}$	$8\frac{1}{2} = 8\frac{8}{16} = 7\frac{24}{16}$ $-\ 2\frac{15}{16} = 2\frac{15}{16} = 2\frac{15}{16}$
6.	$5\frac{3}{8} = 5\frac{3}{8} = 4\frac{11}{8}$ $-\ 2\frac{1}{2} = 2\frac{4}{8} = 2\frac{4}{8}$	$9\frac{4}{5} = 9\frac{8}{10} = 8\frac{18}{10}$ $-\ 1\frac{9}{10} = 1\frac{9}{10} = 1\frac{9}{10}$

Subtract in rows 7 to 12. Work carefully; in some examples you will not need to borrow.

	a	b
7.	$7\frac{1}{12}$ $-\ 3\frac{1}{6}$	$4\frac{3}{5}$ $-\ 2\frac{3}{10}$
8.	$6\frac{1}{8}$ $-\ 4\frac{9}{16}$	$1\frac{3}{16}$ $-\ \frac{1}{2}$
9.	$7\frac{1}{16}$ $-\ 1\frac{1}{8}$	$9\frac{1}{3}$ $-\ 8\frac{11}{12}$
10.	$7\frac{1}{4}$ $-\ 2\frac{5}{8}$	$4\frac{7}{8}$ $-\ 1\frac{13}{16}$
11.	$9\frac{3}{8}$ $-\ 5\frac{3}{4}$	$8\frac{7}{16}$ $-\ 2\frac{5}{8}$
12.	$5\frac{1}{2}$ $-\ 3\frac{7}{8}$	$4\frac{1}{8}$ $-\ 2\frac{5}{16}$

More Borrowing in Subtracting Mixed Numbers

Tom wants to go swimming at Lakeside. Bob wants to go to Sandy Beach. How much farther is Sandy Beach than Lakeside?

$$8\tfrac{1}{2} = 8\tfrac{5}{10} = 7\tfrac{15}{10}$$
$$-\ 6\tfrac{7}{10} = 6\tfrac{7}{10} = 6\tfrac{7}{10}$$
$$1\tfrac{8}{10} = 1\tfrac{4}{5}$$

Side work

$1 = \tfrac{10}{10}$

$\tfrac{5}{10} + \tfrac{10}{10} = \tfrac{15}{10}$

1. In the box above, we first change $\frac{1}{2}$ to _____. Then we have like-fractions.

But we cannot take $\frac{7}{10}$ from $\frac{5}{10}$, so we must change 1 of the 8 wholes to _____ and put it with the $\frac{5}{10}$ to make _____.

$6\frac{7}{10}$ from $7\frac{15}{10}$ = _____. In best form, the answer is _____.



2. How far is it from Lakeside to Sandy Beach? $6\frac{7}{10}$ mi. + $8\frac{1}{2}$ mi. = _____

Write the missing numerators below.

3. $4\frac{2}{15} = 3\frac{\quad}{15}$

4. $7\frac{2}{5} = 6\frac{\quad}{5}$

5. $9\frac{5}{16} = 8\frac{\quad}{16}$

6. $14\frac{1}{12} = 13\frac{\quad}{12}$

Finish the examples in row 7.

a	b	c
7. $9\frac{1}{4} = 9\frac{3}{12} = 8\frac{15}{12}$	$2\frac{3}{5} = 2\frac{6}{10} = 1\frac{16}{10}$	$8\frac{3}{4} = 8\frac{9}{12} = 7\frac{21}{12}$
$-\ 1\frac{7}{12} = 1\frac{7}{12} = 1\frac{7}{12}$	$-\ \frac{7}{10} = \frac{7}{10} = \frac{7}{10}$	$-\ 5\frac{11}{12} = 5\frac{11}{12} = 5\frac{11}{12}$
$7\frac{8}{12} =$		

Subtract in rows 8 and 9. Be sure answers are in best form.

8. $4\frac{1}{5}$	$8\frac{1}{4}$	$5\frac{7}{12}$
$-\ 2\frac{7}{10}$	$-\ 3\frac{7}{16}$	$-\ \frac{1}{3}$
9. $9\frac{7}{15}$	$8\frac{1}{10}$	$7\frac{3}{8}$
$-\ 5\frac{3}{5}$	$-\ 1\frac{1}{2}$	$-\ 4\frac{7}{16}$

Can You Add Three Mixed Numbers?

[*Related fractions*]

1. Box A. Are $\frac{3}{8}$, $\frac{1}{2}$, and $\frac{9}{16}$ related fractions? _____

A

$4\frac{3}{8} = 4\frac{6}{16}$
$2\frac{1}{2} = 2\frac{8}{16}$
$+ 3\frac{9}{16} = 3\frac{9}{16}$
$9\frac{23}{16} = 9 + 1\frac{7}{16} = 10\frac{7}{16}$

Side work
$\frac{23}{16} = 1\frac{7}{16}$

2. Which is the smallest fractional unit, $\frac{1}{8}$, $\frac{1}{2}$, or $\frac{1}{16}$? _____

3. What is the common denominator for the fractions in Ex. 1? _____

In best form, the sum is _____.

4. Box B. Can 10, the largest denominator, be divided evenly by 5? _____

by 2? _____

B

$3\frac{1}{5} = 3\frac{2}{10}$
$4\frac{7}{10} = 4\frac{7}{10}$
$+ 1\frac{1}{2} = 1\frac{5}{10}$
$8\frac{14}{10} = 8 + 1\frac{2}{5} = 9\frac{2}{5}$

Side work

5. When we change fifths and halves to tenths, do we make the fractional units larger or smaller? _____

6. Write the side work in box B.

Write each fraction in Ex. 7 to 14 in best form.

7. $\frac{11}{8} =$ _____ **8.** $\frac{15}{20} =$ _____ **9.** $\frac{20}{12} =$ _____ **10.** $\frac{13}{6} =$ _____

11. $\frac{28}{16} =$ _____ **12.** $\frac{26}{12} =$ _____ **13.** $\frac{27}{10} =$ _____ **14.** $\frac{33}{16} =$ _____

Add in Ex. 15 to 20. Show the side work if it helps you.

15. $4\frac{2}{3} + 1\frac{11}{12} + 3\frac{1}{2}$

16. $2\frac{5}{12} + 6\frac{1}{4} + 1\frac{5}{6}$

17. $\frac{1}{8} + 2\frac{9}{16} + 1\frac{3}{4}$

18. $1\frac{5}{16} + 4\frac{7}{8} + 3\frac{1}{2}$

19. $7\frac{3}{4} + 2\frac{5}{8} + 4\frac{13}{16}$

20. $5\frac{11}{12} + 3\frac{3}{4} + \frac{1}{3}$

A Day of Fractions

Janet's teacher asked the pupils in the class to keep a record of the fractions they used during the day. Here are some of Janet's fraction problems. Be careful as you solve them. Give your answers in best form.

1. There were 16 slices in the loaf of bread. Mother toasted 6 slices for breakfast. What fraction of the loaf was that?

---

2. It is $\frac{9}{10}$ mi. from home to our school. How long is my trip to school and home again?

---

3. My brother John goes $1\frac{1}{2}$ mi. to the high school. How much farther is it to John's school than to mine?

---

4. Our dog, Jolly, gets $1\frac{1}{2}$ cups of meat mixed with $\frac{3}{4}$ cup of broth, and 1 cup of cracked dog biscuit. How many cups should his feeding dish hold?

---

5. My brother John had to rake leaves before he could cut the grass. It took him $1\frac{1}{4}$ hr. to rake up the leaves and $2\frac{1}{2}$ hr. to cut the grass. How long did he work?

---

6. Dad lets us watch television for no more than 2 hr. a day. Today I watched one program that lasted $\frac{1}{2}$ hr.; another that lasted $\frac{3}{4}$ hr.; and one in the evening that took $\frac{1}{2}$ hr. How much longer could I have watched TV today?

---

7. Dad bought a new storm door that measured 80 in. high. He had to cut off $\frac{3}{4}$ in. to make it fit the door frame. How high was the door frame?

---

8. A year ago, I weighed $63\frac{7}{8}$ lb. Now I weigh $70\frac{1}{4}$ lb. How many pounds did I gain during the year?

---

9. The climbing gym in the park has bars at different heights from the ground. The lowest bar is $1\frac{1}{2}$ ft. high. The highest one is $6\frac{3}{4}$ ft., or how much higher from the ground than the lowest?



Add or Subtract. Watch the Signs!

1. $4\frac{1}{2} - 2\frac{3}{16}$

2. $3\frac{5}{12} - 2\frac{1}{6}$

3. $8\frac{3}{4} - 2\frac{7}{16}$

4. $3\frac{5}{6} + 8\frac{1}{12}$

5. $1\frac{1}{2} - \frac{7}{8}$

6. $7\frac{1}{5} - \frac{3}{10}$

7. $4\frac{5}{12} - 1\frac{1}{2}$

8. $1\frac{7}{10} - \frac{2}{5}$

9. $6\frac{1}{2} - 3\frac{7}{12}$

10. $3\frac{11}{16} - \frac{7}{8}$

11. $9\frac{7}{15} - 3\frac{2}{5}$

12. $4\frac{5}{8} + 9\frac{3}{4}$

13. $4\frac{3}{5} + \frac{1}{2} + 5\frac{3}{10}$

14. $8\frac{7}{8} + 7\frac{1}{16} + 9\frac{3}{4}$

15. $8\frac{5}{6} + 3\frac{2}{3} + 5\frac{7}{12}$

Find answers for problems 16 to 18.

16. Sue's club had a picnic at the beach. Sue's mother brought $1\frac{3}{4}$ lb. of hot dogs, and Jean's mother brought $1\frac{7}{8}$ lb. How many pounds of hot dogs did they have together?

---

17. Sue brought $1\frac{1}{2}$ doz. rolls, and Jean brought $2\frac{3}{4}$ doz. How many dozen rolls was that in all?

---

18. Jean brought how many more dozen rolls than Sue did?

Testing What You Have Learned

[*Cumulative Review*]

In Ex. 1 to 6, circle the correct answers.

1. Reduced to lowest terms, $\frac{12}{16}$ equals

$\frac{5}{8}$ $\frac{5}{6}$ $\frac{3}{4}$ $\frac{6}{8}$

2. $\frac{14}{8}$ equals what mixed number?

$1\frac{2}{3}$ $2\frac{1}{4}$ $1\frac{5}{8}$ $1\frac{3}{4}$

3. $4\frac{3}{8}$ has the same value as

$3\frac{11}{8}$ $4\frac{5}{8}$ $3\frac{10}{8}$ $2\frac{11}{8}$

4. $\frac{18}{6}$ equals which of these numbers?

$\frac{12}{3}$ 2 $2\frac{1}{2}$ 3

5. A common denominator for $\frac{5}{8}$ and $\frac{3}{16}$ is

8 16 12 10

6. $\frac{3}{10}$ has the same value as

$\frac{3}{5}$ $\frac{6}{12}$ $\frac{6}{20}$ $\frac{2}{3}$

In Ex. 7 to 14, write the answers.

7. 15 min. is what part of an hour? ____

8. $\frac{3}{4}$ yd. = _____ inches.

9. $3\frac{1}{2}$ dollars = _____ half dollars.

10. $1\frac{3}{4}$ yd. is how much less than 2 yd.?

---

11. Which distance is longer, $\frac{1}{10}$ mile or $\frac{1}{5}$ mile?

---

12. Which is the longer time, $\frac{1}{4}$ hr. or 20 minutes?

---

13. $n + \frac{1}{3} = 2\frac{2}{3}$ $n =$ _____

14. $6 - n = 1\frac{1}{4}$ $n =$ _____

How Accurate Are You?

Do what the signs tell you to do.

	a	b	c	d
1.	$4\frac{1}{5}$ $+ 2\frac{3}{10}$	$8\frac{2}{3}$ $- 1\frac{1}{6}$	$7\frac{1}{4}$ $- 3\frac{7}{8}$	$5\frac{1}{2}$ $+ 7\frac{3}{4}$
2.	$\$5.48$ $\times 37$	$54\overline{)3,475}$	897 $\times 705$	$78\overline{)3,965}$

How Well Can You Estimate?

Circle the answer that is nearest to the exact answer. Do not write in the boxes now.

1. What is the quotient of $3{,}888 \div 54$?

between 60 and 70;
between 70 and 80;
between 80 and 90.

2. $8 \times \$9.86 = ?$

\$80; \$72; \$48

3. $\$2.04 \div 34 = ?$

\$6.00; 60¢; 6¢

4. What is the difference between \$90.05 and \$83.79?

\$7; \$6; \$5

5. What is the sum of these numbers?
$8{,}253 + 836 + 6{,}948$

14,000; 15,000; 16,000

6. What is the quotient of $5{,}544 \div 84$?

between 60 and 70;
between 70 and 80;
between 80 and 90.

7. Mr. Wells went fishing. He rented a boat for 6 hr. at 85¢ an hour and spent \$1 for bait. How much did he spend in all?

\$5.40; \$6.40; \$6.85

8. If a train covers 561 miles in 11 hours, what is its average rate in miles an hour?

70; 60; 50

9. A car averages 48 miles an hour. From 8:00 A.M. to 12:00 noon, how many miles will it travel?

200; 250; 300

10. How many hours will it take a boat that averages 32 miles an hour to travel 256 miles?

10; 9; 8

After you have estimated the answers for Ex. 1 to 10, find exact answers on another piece of paper. Write your answers in the boxes.

How Sharp Are You at Finding Mistakes?

Put X on each of the four examples with wrong answers. Then copy the examples in the boxes and work them correctly.

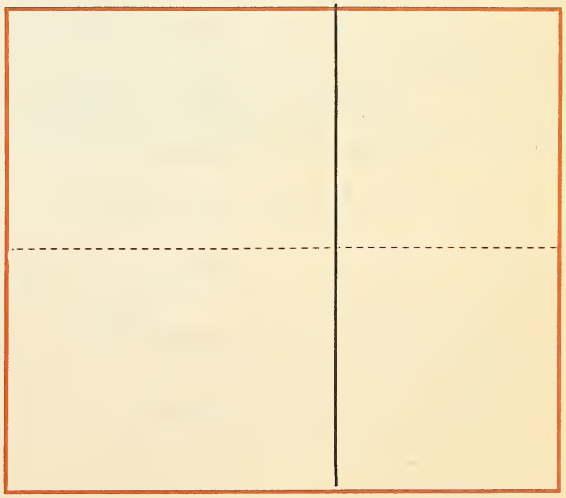
1.
$$\begin{array}{r} 5\frac{2}{3} = 5\frac{4}{6} \\ +\ 7\frac{5}{6} = 7\frac{5}{6} \\ \hline 12\frac{9}{6} = 13 \end{array}$$

2.
$$\begin{array}{r} 7\frac{1}{4} = 6\frac{10}{8} \\ -\ 3\frac{7}{8} = 3\frac{7}{8} \\ \hline 3\frac{3}{8} \end{array}$$

3.
$$\begin{array}{r} \$3.86 \\ \times\ 45 \\ \hline 19\ 30 \\ 154\ 4 \\ \hline \$163.70 \end{array}$$

4.
$$\begin{array}{r} 53 \\ 34\overline{)1{,}782} \\ 1\ 70 \\ \hline 82 \\ 92 \\ \hline \end{array}$$

5.
$$\begin{array}{r} \$40.03 \\ -\ 7.89 \\ \hline \$32.24 \end{array}$$



How Good Are You at Solving Problems?

Thurs.	23,750
Fri.	31,426
Sat.	36,288

1. The attendance for the last three days that the county fair was open is given in the box.

Estimate to the nearest ten thousand the total attendance for the three days.

---

2. What was the exact total for the three days?

---

3. What was the average daily attendance for these days?

---

4. At the exhibit of handwork, 24 prizes were awarded in all. Of these, $\frac{1}{4}$ were first prizes, $\frac{1}{3}$ were second prizes, and the rest were third prizes.

There were how many first prizes? _____

second prizes? _____ third prizes? _____

5. At the flower exhibit, there were 8 first prizes, 12 second prizes, and 16 third prizes. What was the total number of flower prizes awarded?

---

6. What fractional part of the prizes in Ex. 5 were first prizes? _____

second prizes? _____ third prizes? _____

7. Mike's family spent $\frac{1}{2}$ hr. at the flower exhibit; $\frac{1}{4}$ hr. at the handwork booth; $\frac{3}{4}$ hr. at the exhibit of farm animals; and $1\frac{1}{2}$ hr. doing other things. How many hours did they spend at the fair in all?

---

8. If Mike's family went into the fair grounds at 1:30 P.M., what time was it when they left? (Use your answer for Ex. 7.)

Reviewing the Meaning of Arithmetic Words

8	78	800	526
$60\overline{)480}$	$\times\ 9$	$-\ 367$	$+\ 89$
	702	433	615

1. Find in the box and copy below:

a divisor _____ a difference _____

a multiplier _____ a product _____

a quotient _____ a dividend _____

an addend _____ a sum _____

2. Write the fraction which has 8 for the denominator and 3 for the numerator.

---

3. Reduce $\frac{9}{12}$ to lowest terms. _____

4. Write two like-fractions which have 10 as denominator.

---

5. Write two unlike-fractions which have 5 as numerator.



6

A New Step in Finding Correct Quotient Figures

Rita and her family have come 296 miles by bus to visit Yellowstone Park. If the bus averaged 37 miles an hour, how many hours did it take to make the trip?

A	B	C
$37\overline{)296}$ x	Do these steps mentally or on paper: $30\overline{)290}$ 9+ $37 \times 9 = 333$ $37 \times 8 = 296$	Write this: 8 $37\overline{)296}$ x 296

1. In dividing 296 by 37, we first locate the quotient figure (box A). In what place will it be written?

---

2. Box B shows the steps for finding the correct quotient figure.

a. First we estimate: $290 \div 30 =$ _____. But we can't be sure there are nine 37's in 296, so we do not write 9 until we have tested it by multiplying.

[*Non-apparent quotient*]

b. $9 \times 37 =$ _____. But 333 is more than 296, so 9 is not the correct quotient.

c. Next try 8, the next smaller number.

$8 \times 37 =$ _____. The correct quotient figure is _____.

This example shows that estimated quotient figures are not always correct, or true, quotient figures.

3. For Ex. D, what is the estimated quotient figure? _____

We can see that 9 is too large because $9 \times 20 = 180$ and $9 \times 8 = 72$ more. We try 8, then 7.

The correct quotient figure is _____.

4. Try to work Ex. E without looking at box F.

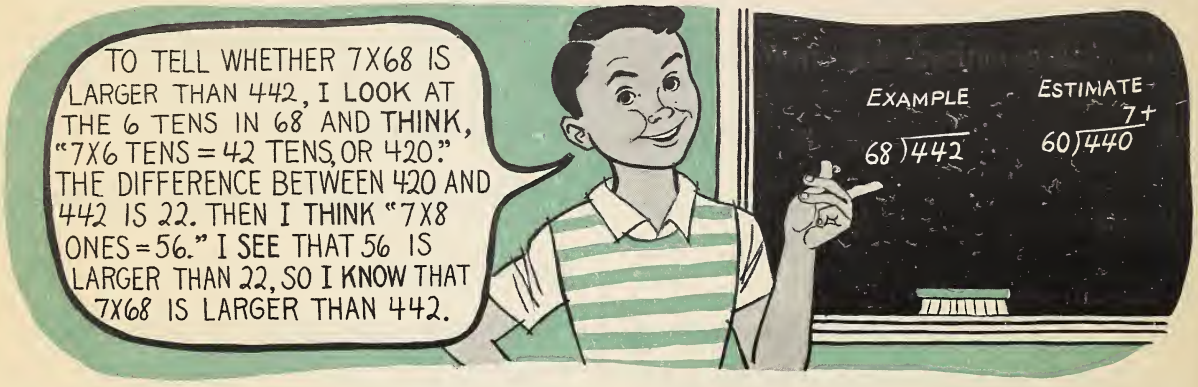
D	E	F
9 ← Too large $28\overline{)198}$ x Side work *Try 8*: 28 × 8 = 224 *Try 7*: 28 × 7 = 196	$39\overline{)250}$	Side work for Ex. E *Try 8*: 39 × 8 = 312 *Try 7*: 39 × 7 = 273 *Try 6*: 39 × 6 = 234

Practice in Division

Divide in Ex. 1 to 9. Write the side-work steps.

1. $64\overline{)491}$
2. $78\overline{)436}$
3. $45\overline{)381}$
4. $84\overline{)660}$
5. $36\overline{)237}$
6. $93\overline{)641}$
7. $46\overline{)389}$
8. $87\overline{)650}$
9. $69\overline{)534}$

A Way of Testing Estimated Quotient Figures



Use the way explained in the picture to help you decide which is larger—the product of the numbers in column a or the number in column b. Circle whichever is larger.

	a	b	c
1.	7×45	320	----------
2.	6×58	324	----------
3.	9×44	384	----------
4.	5×87	448	----------
5.	8×26	192	----------
6.	7×59	400	----------
7.	6×46	295	----------
8.	9×65	595	----------
9.	8×27	220	----------

Now find exact products for column a. Write them in column c.

Time for Practice!

Divide in rows 1 to 3. Multiply mentally to test your estimates.

	a	b	c	d
1.	$79\overline{)640}$	$36\overline{)257}$	$45\overline{)439}$	$58\overline{)226}$
2.	$67\overline{)574}$	$59\overline{)273}$	$77\overline{)431}$	$39\overline{)195}$
3.	$68\overline{)583}$	$28\overline{)121}$	$37\overline{)296}$	$64\overline{)554}$

If Estimated Quotient Figures Are Too Large

Test the quotients in rows 1 to 3 by multiplying mentally. If a quotient is correct, finish the work. If a quotient is incorrect, cross it out and write the correct quotient. Then finish the work.

If you can't multiply mentally, use side work.

[*One-place quotients*]

	a	b
1.	$28\overline{)175}$	$86\overline{)405}$
2.	$64\overline{)493}$	$38\overline{)256}$
3.	$48\overline{)376}$	$87\overline{)584}$

Divide in rows 4 and 5.

4.	$94\overline{)253}$	$25\overline{)189}$
5.	$76\overline{)486}$	$27\overline{)108}$



Problems to Solve

1. During vacation, Bill picked berries on his grandfather's farm. On Monday he picked 24 qt.; on Wednesday, 21 qt.; and on Friday, 27 qt. For the days he worked, what was the average number of quarts Bill picked a day?

---

2. In a crate of berries like those shown in the picture, there are 24 qt. How many crates of berries did Bill pick?

---

3. At 45¢ a quart, how much did Bill's grandfather get for a crate of berries?

---

4. Mr. Hill sold 84 crates of cherries for $336. How much was this a crate?

---

5. At the grocery store, Sharon's mother paid $1.62 for 6 qt. of cherries. How much was this a quart?

Divide in rows 6 and 7.

	a	b	c	d
6.	$37\overline{)240}$	$69\overline{)547}$	$56\overline{)467}$	$38\overline{)175}$
7.	$29\overline{)134}$	$72\overline{)373}$	$48\overline{)336}$	$69\overline{)496}$

Work Carefully in Finding Two-Place Quotients

[*Non-apparent quotients*]

A

$$58\overline{)2,784}$$

(x x)

B Side work

First partial dividend

$50\overline{)270}$ (tens) 5+

58 × 5 = 290

58 × 4 = 232

Second partial dividend

$50\overline{)460}$ (ones) 9+

58 × 9 = 522

58 × 8 = 464

1. Box A. The first partial dividend is _____ (tens). There will be quotient figures in _____ place and in _____ place.

2. Box B. What is the first estimate for the ten's quotient figure? ____ Is this the true quotient figure? _____

Write the true quotient figure in box A, multiply, and subtract.

3. The second partial dividend is _____. Finish the work in box A.

C

$$47\overline{)3,604}$$ 76, R32

329
314
282
32

47 × 8 = 376

47 × 7 = 329

4. Study Dan's work in box C. Is his quotient correct? _____

When Dan cannot test trial quotients by multiplying mentally, he writes his multiplications neatly as side work.

Divide in rows 5 to 8.

	a	b
5.	$43\overline{)3,307}$	$74\overline{)5,016}$
6.	$85\overline{)4,930}$	$65\overline{)5,630}$
7.	$84\overline{)6,631}$	$45\overline{)3,420}$
8.	$24\overline{)1,987}$	$85\overline{)5,821}$

Important Tests for Trial Quotients

Remember: We cannot be sure a quotient figure is correct until we have made two tests:

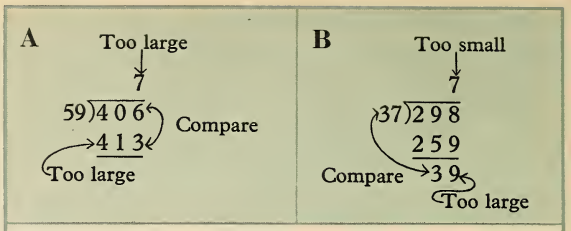
Multiply and compare.
Subtract and compare.

1. Box A. What quotient figure would you try next? ____ $6 \times 59 =$ _____.

Would 6 be correct? _____

2. Box B. What quotient figure would you try next? ____ $8 \times 37 =$ _____.

Would 8 be correct? _____



If you do not test your quotient figures before you write them, you will often need to erase.

Try to *think* your multiplications whenever you can. If you need to write them out, it is better to write them neatly beside your division than to use another piece of paper.

In rows 3 and 4, write the products of your trial quotients beside your division if you can't test them mentally.

	a	b	c
3.	$67\overline{)3,946}$	$38\overline{)1,646}$	$79\overline{)3,002}$
4.	$58\overline{)3,944}$	$49\overline{)3,782}$	$89\overline{)4,207}$

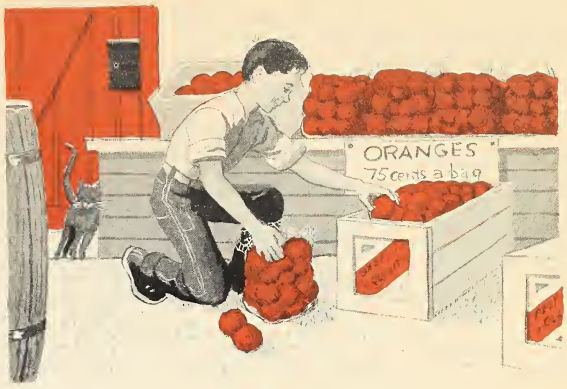
Never Try a Quotient Figure Larger than 9

1. Fred puts 24 oranges in a bag. How many bags can he fill from a box containing 210 oranges?

The quotient is not 10, but it is near 10. We try 9 first, then 8.

$$\begin{array}{r} 8, \text{R}18 \\ \times \\ 24\overline{)210} \\ 192 \\ \hline 18 \end{array} \qquad \begin{array}{r} 24 \\ \times\ 9 \\ \hline 216 \end{array} \qquad \begin{array}{r} 24 \\ \times\ 8 \\ \hline 192 \end{array}$$

Fred can fill ____ bags, and there will be _____ oranges left over.



In row 2, do not find the quotients. Just locate each quotient figure with a tiny x.

	a	b	c	d	e	f	g
2.	$27\overline{)298}$	$49\overline{)403}$	$56\overline{)512}$	$63\overline{)695}$	$47\overline{)438}$	$25\overline{)275}$	$74\overline{)713}$

Now divide in rows 3 and 4.

	a	b	c
3.	$37\overline{)3,478}$	$48\overline{)4,681}$	$27\overline{)2,300}$
4.	$29\overline{)2,732}$	$35\overline{)3,045}$	$47\overline{)4,183}$

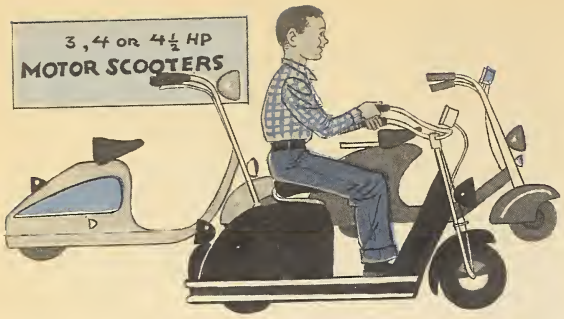
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5. The picture shows the price of a bag of 24 oranges. Is the price of 1 orange nearer to 3¢ or to 4¢?

---

6. How much money will the storekeeper take in from the sale of 95 bags of oranges?

Can You Divide by Teen Numbers?



1. George has \$90 more to pay on a motor scooter he is buying. He will pay the \$90 in monthly payments of \$15 each. How many months will it take him to finish paying? (See box A.)

_____

2. In box A, we can see at once that both 9 and 8 would be too large to use as quotient figures.

A

	Trials	
6	15	15
15)90	× 7	× 6
90	105	90

We first try _____, then _____.

3. George's father has \$864 to pay on his new car. If he makes 18 equal monthly payments, how much will he have to pay each month? (See box B.)

_____

B

	Trials	
\$48	18	18
18)\$864	× 5	× 4
72	90	72
144	18	18
144	× 9	× 8
	162	144

4. Box B. For the ten's quotient figure we first try 5.

$5 \times 18 =$ _____,

so the correct quotient figure is _____.

For the one's quotient figure, we try 9, the largest number we ever try.

$9 \times 18 =$ _____ $8 \times 18 =$ _____

In row 5, do not find quotients. Just locate each quotient figure with a tiny x.

5. $19\overline{)578}$ $18\overline{)196}$ $16\overline{)1{,}493}$

Divide in rows 6 and 7. Test your trial quotients by multiplying mentally whenever you can.

	a	b	c	d
6.	$19\overline{)867}$	$27\overline{)2{,}254}$	$12\overline{)1{,}068}$	$14\overline{)876}$
7.	$34\overline{)975}$	$18\overline{)1{,}485}$	$16\overline{)1{,}296}$	$15\overline{)947}$

Finding Three-Place Quotients

	Trials		
897	68	68	
xxx	× 9	× 8	Check
68)60,996	612	544	897
54 4↓			× 68
6 59			7 176
6 12↓			53 82
476	68		60,996
476	× 7		
	476		

1. In the box above, the first partial dividend is _____ (hundreds). The quotient will be a ____-place number.

2. We try 9 for hundred's quotient figure, but 9 is too large, so we try _____.

3. We do not need any trials for the ten's quotient figure because we look at the trials for the hundred's quotient figure and see that $9 \times 68 = 612$.

The ten's quotient figure is _____.

4. The one's quotient figure is _____.

5. Do we check a 3-place quotient just as we check a 2-place quotient?

_____

In row 6, do not divide. Just locate each quotient figure with a tiny x.

6. $54\overline{)6{,}031}$ $78\overline{)10{,}487}$ $67\overline{)1{,}583}$

Divide in rows 7 and 8. Test your trial quotients beside your division if you need to.

	a	b	c
7.	$58\overline{)4\,2\,,4\,8\,0}$	$25\overline{)8\,,6\,9\,7}$	$49\overline{)3\,0\,,9\,7\,0}$
8.	$28\overline{)1\,,9\,8\,8}$	$49\overline{)2\,7\,,9\,8\,4}$	$39\overline{)3\,0\,,6\,0\,4}$

Can You Divide Dollars and Cents?

The 14 boys in Frank's Ranch Club all wanted cowboy hats. Frank's mother had the hats sent out from the store. The bill for the 14 hats was $27.72. What did each boy have to pay for his hat?

A

$$14\overline{)\$27.72}\quad \$1.98$$

$$\begin{array}{r} 14 \\ \hline 137 \\ 126 \\ \hline 112 \\ 112 \\ \hline \end{array}$$

Trials

$$\begin{array}{r} 14 \\ \times\ 9 \\ \hline 126 \end{array} \qquad \begin{array}{r} 14 \\ \times\ 8 \\ \hline 112 \end{array}$$



1. In box A, $27.72 is divided by 14 just as 2,772 would be divided. In the box, draw arrows pointing to the two things that we wrote to show that the quotient is a money number.

B

$$24\overline{)\$21.36}\quad \$0.89$$

$$\begin{array}{r} 192 \\ \hline 216 \\ 216 \\ \hline \end{array}$$

Trials

$$\begin{array}{r} 24 \\ \times\ 9 \\ \hline 216 \end{array} \qquad \begin{array}{r} 24 \\ \times\ 8 \\ \hline 192 \end{array}$$

C Check

$$\begin{array}{r} \$0.89 \\ \times\ 24 \\ \hline \end{array}$$

2. Study the work in box B. Check it in box C.

In Ex. 4 to 6, write x's to locate quotient figures. Then write the dollar sign and decimal point in each quotient, as in Ex. 3.

3. $75\overline{)\$13.86}$ — $\$\ 0.xx$

4. $84\overline{)\$13.92}$

5. $25\overline{)\$169.54}$

6. $36\overline{)\$308.88}$

Divide in rows 7 and 8.

	a	b	c
7.	$54\overline{)\$46.44}$	$48\overline{)\$299.04}$	$87\overline{)10,596}$
8.	$67\overline{)\$38.86}$	$27\overline{)\$96.93}$	$59\overline{)21,973}$

Zeros in the Quotient

A

Start this way:	Finish this way:
70 R	709 R
96)68,064	96)68,064
672↓	672↓↓
86	864
	864

Study box A. The second partial dividend, 86 (tens), cannot be divided by 96, so we write 0 as the ten's quotient figure. The zero keeps the other figures in their proper places. Zero is the place-holder.

Study box B. Notice that the third partial dividend (18 ones) cannot be divided by the divisor (67). Then zero is the one's quotient figure. The 18 is written as the remainder.

B

590, R18
67)39,548
335↓
604
603↓
18

In box B, zero is the place-holder in one's place. It keeps the 9 and the 5 in their places. Without the zero, the quotient would be 59, which is only $\frac{1}{10}$ as large as it should be.

In row 1, write the work that goes with the quotients.

	a	b	c	d
1.	560 75)42,000	508 36)18,288	107 54)5,778	920, R6 89)81,886

Divide in row 2. Write all the work.

2.	79)63,674	54)46,980	38)22,990	47)5,136

Work the examples below on another sheet of paper. Write just the answers in this Workbook.

3.	69)6,163	35)19,880	67)5,382	17)$16.66
4.	49)44,450	87)55,941	19)18,620	36)$304.92
5.	93)74,785	48)$43.68	76)40,232	58)$388.62

Watch the Zeros in Three-Place Quotients



1. In 27 days, 16,212 children rode the merry-go-round at Riverside Park. That was an average of how many children per day?

Study the work in the box. We cannot divide either 1 ten or 12 ones by 31, so we write zeros in the quotient in ten's place and in one's place.

```
      600, R12
27)16,212
   162
    ---
     12
```

2. In the box, the quotient is _____.

There is a remainder of _____.

We say that the average was between 600 and 601 children per day.

After the first quotient figure is placed, we must write a quotient figure for each dividend figure we bring down. Sometimes a quotient figure is zero.

Divide in rows 3 and 4.

	a	b	c	d
3.	56)44,835	64)32,512	39)$179.40	77)$616.04
4.	95)57,665	89)62,300	56)$352.80	19)$171.13

5. How much money does the merry-go-round take in on a day when 600 children ride? (The picture tells the price of 1 ride.)

_____

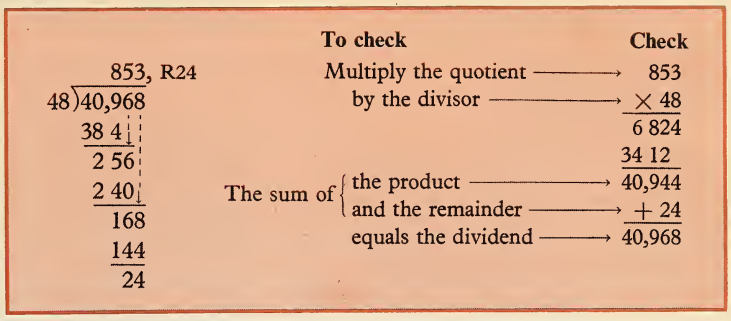
6. The merry-go-round can take 20 children on each ride. How many rides are needed to handle 600 children?

_____

Checking Two-Place and Three-Place Quotients

Some of the quotients in rows 1 and 2 below are incorrect. Find the incorrect quotients by checking. First study the work in the box to make sure you know how to check.

Change each incorrect quotient to make it correct.



	a	b	c
1.	30, R8 Check 24)7,208	500, R25 Check 94)47,025	406, R2 Check 83)33,700
2.	97, R4 Check 68)6,600	805 Check 68)57,800	600 Check 18)10,800

Copy Ex. 3 to 14 on another sheet of paper and divide. Write just the quotients and remainders in this Workbook.

3. 75)6,042	**4.** 37)2,151	**5.** 39)$15.60	**6.** 57)$54.97
7. 58)51,968	**8.** 28)2,109	**9.** 75)38,100	**10.** 89)53,435
11. 54)43,690	**12.** 19)1,088	**13.** 45)30,285	**14.** 83)50,547



Selling Farm Products at the City Market

[*2-place multipliers and divisors*]

1. Roger's father takes his farm products to the market in the city. Sometimes Roger goes with him. One day Roger's father sold 58 hundred-pound bags of potatoes for $266.80. How much was this a bag?

---

2. Did Roger's father receive more than 5¢ a pound or less? (Multiply to find out.)

---

3. Phil's father sells his potatoes by the bushel. How much did he receive for 148 bu. at $3 per bushel?

---

4. If the average weight of a bushel of potatoes is 60 lb., how much did Phil's father get per pound for his potatoes?

---

5. At $1.25 a bushel, how much will 18 bushels of squashes bring?

---

6. Mr. Adams sold 45 fifty-pound bags of onions for $112.50. How much was this a bag?

---

7. How much did Mr. Adams get per pound for the onions?

---

8. Mr. Adams bought a new truck for his farm. He traded in his old truck and then paid $1,568 more in equal monthly payments. If there were 28 payments, how much did Mr. Adams pay each month?

---

9. Mr. Adams's truck averages 14 miles to a gallon of gasoline. How many gallons will it use on a trip of 266 miles?

---

10. How much did Mr. Adams get for 39 dozen ears of sweet corn at 35¢ a dozen?

How Well Can You Change Fractions?

[*Readiness for new work*]

1. For box A, *think*, "The denominator 5 (of $\frac{4}{5}$) was multiplied by what number to get the denominator 15?

"_____ $\times 5 = 15$, so we must multiply the numerator, 4 (of $\frac{4}{5}$), by 3 also."

Change $\frac{4}{5}$ to fifteenths
A $\frac{4}{5} = \frac{?}{15}$ $? \times 5 = 15$ $\frac{3 \times 4}{3 \times 5} = \frac{12}{15}$

This gives the equal fraction $\frac{\quad}{15}$.

Write the missing numerators below.

	a	b	c
2.	$\frac{4}{5} = \frac{\quad}{20}$	$\frac{2}{3} = \frac{\quad}{15}$	$\frac{7}{8} = \frac{\quad}{24}$
3.	$\frac{5}{8} = \frac{\quad}{16}$	$\frac{5}{6} = \frac{\quad}{24}$	$\frac{2}{3} = \frac{\quad}{12}$

4. To reduce a fraction to lowest terms, divide both terms by the _____ number that will divide both evenly.

Reduce $\frac{16}{20}$ to lowest terms	Change $\frac{30}{20}$ to a mixed number
B $\frac{16}{20} = \frac{?}{?}$ $\frac{16 \div 4}{20 \div 4} = \frac{4}{5}$	C $\frac{30}{20} = ?$ $\quad \frac{20}{20} = 1$ $\frac{30}{20} = 1\frac{10}{20} = 1\frac{1}{2}$

5. For box B, *think*, "Both terms of $\frac{16}{20}$ (16 and 20) are in the division table with divisor 4, so ____ is the divisor to use."

6. For box C, *think*, "$\frac{20}{20} = 1$, so $\frac{30}{20} =$ 1 whole and ____ more. Reduce $\frac{10}{20}$ to ____."

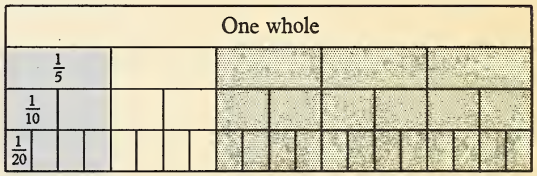
In rows 7 to 9, reduce the fractions to lowest terms.

	a	b	c
7.	$\frac{15}{20} =$ _____	$\frac{12}{24} =$ _____	$\frac{10}{15} =$ _____
8.	$\frac{9}{15} =$ _____	$\frac{12}{16} =$ _____	$\frac{8}{20} =$ _____
9.	$\frac{12}{15} =$ _____	$\frac{14}{16} =$ _____	$\frac{9}{12} =$ _____

In rows 10 to 12, change the improper fractions to best form.

10.	$\frac{19}{12} =$ _____	$\frac{23}{15} =$ _____	$\frac{27}{16} =$ _____
11.	$\frac{29}{16} =$ _____	$\frac{30}{10} =$ _____	$\frac{17}{16} =$ _____
12.	$\frac{27}{20} =$ _____	$\frac{25}{8} =$ _____	$\frac{32}{16} =$ _____

D

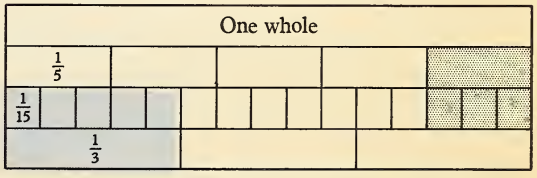


13. For diagram D, write three equal fractions shown by

a. the blue part. _____ _____ _____

b. the gray part. _____ _____ _____

E



14. For diagram E, write two equal fractions shown by

a. the blue part. _____ _____

b. the gray part. _____ _____

A	B
$\frac{5}{6} = \frac{\quad}{12}$ $\frac{3}{4} = \frac{\quad}{12}$ $+\frac{5}{12} = \frac{\quad}{12}$	$\frac{9}{16} = \frac{\quad}{16}$ $\frac{1}{2} = \frac{\quad}{16}$ $+\frac{7}{8} = \frac{\quad}{16}$

1. Box A. To add, we must change the sixths and fourths to equal fractions with the smaller fractional unit $\frac{1}{12}$.

The common denominator is ____, which is the largest of the given denominators.

Remember: The smaller the size of the fractional unit, the larger the denominator.

Finish the work in box A.

2. Box B. Can 16, the largest of the three given denominators, be divided evenly (without a remainder) by 2? ---------- by 8? ---------- Is 16 the common denominator? ----------

Finish the work in box B.

A common denominator must be divisible without a remainder by each of the given denominators.

To add two or more unlike-fractions, we first try the largest of the given denominators to see whether it can be the common denominator. If it can, we change each of the other fractions to an equal fraction which has the common denominator.

Add in rows 3 to 6. Be sure all your answers are in best form.

	a	b
3.	$\frac{2}{3}$ $\frac{3}{4}$ $+\frac{7}{12}$	$\frac{5}{16}$ $\frac{5}{8}$ $+\frac{3}{4}$
4.	$\frac{4}{5}$ $\frac{7}{10}$ $+\frac{1}{2}$	$\frac{1}{2}$ $\frac{2}{3}$ $+\frac{11}{12}$
5.	$2\frac{3}{10}$ $4\frac{1}{2}$ $+5$	$1\frac{1}{4}$ $2\frac{3}{16}$ $+1\frac{1}{2}$
6.	$\frac{5}{8}$ $7\frac{1}{2}$ $+8\frac{3}{4}$	$4\frac{5}{6}$ $\frac{1}{2}$ $+3\frac{2}{3}$

7. How many feet of wire netting are needed for a pen shaped like a rectangle $12\frac{1}{2}$ ft. long and $9\frac{3}{4}$ ft. wide?

Table of Equal Fractions

A	$\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{6}{12}$
B	$\frac{1}{3} = \frac{2}{6} = \frac{3}{9} = \frac{4}{12} = \frac{5}{15} = \frac{6}{18}$
C	$\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16} = \frac{5}{20} = \frac{6}{24}$
D	$\frac{1}{5} = \frac{2}{10} = \frac{3}{15} = \frac{4}{20} = \frac{5}{25} = \frac{6}{30}$
E	$\frac{1}{6} = \frac{2}{12} = \frac{3}{18} = \frac{4}{24} = \frac{5}{30} = \frac{6}{36}$

1. Look at row A in the fraction table above. Say to yourself the equal fractions to which $\frac{1}{2}$ can be changed. Do the same for $\frac{1}{3}$ in row B.

The arrow between rows A and B means that both $\frac{1}{2}$ and $\frac{1}{3}$ can be changed to $\frac{1}{6}$'s (sixths).

2. In the table, the arrow between rows B and C shows that both $\frac{1}{3}$ and $\frac{1}{4}$ can be changed to twelfths.

Then _____ is a common fractional unit for $\frac{1}{3}$ and $\frac{1}{4}$.

3. Look at rows C and D in the table.

To add $\frac{1}{4}$ and $\frac{1}{5}$, you would use _____ as the common fractional unit. The common denominator would be _____.

Finish the addition in box F.

F

$$\frac{1}{4} =$$
$$+\frac{1}{5} =$$

G

$$\frac{1}{5} =$$
$$+\frac{1}{6} =$$

4. Use rows D and E of the fraction table to find a common fractional unit and a common denominator for $\frac{1}{5}$ and $\frac{1}{6}$.

The common denominator is _____. Finish the addition in box G.

5. In boxes F and G, is the common denominator the product of the two given denominators?

In adding or subtracting unlike-fractions, first see if the larger of the given denominators is the common denominator. If it is not, the product of the denominators will be a common denominator.

Finish the work in rows 6 and 7.

	a	b
6.	$\frac{1}{2} = \frac{5}{10}$ $+\frac{3}{5} = \frac{6}{10}$	$\frac{5}{8} = \frac{15}{24}$ $+\frac{1}{3} = \frac{8}{24}$
7.	$\frac{2}{3} = \frac{10}{15}$ $+\frac{2}{5} = \frac{6}{15}$	$\frac{1}{5} = \frac{4}{20}$ $+\frac{3}{4} = \frac{15}{20}$

Add in rows 8 and 9.

8.	$\frac{4}{5}$ $+\frac{1}{3}$	$\frac{2}{3}$ $+\frac{3}{4}$
9.	$\frac{3}{4}$ $+\frac{9}{16}$	$\frac{2}{5}$ $+\frac{3}{4}$

Changing Both Fractions to Subtract Them

1. In box A, can 6, the larger denominator, be the common denominator? _____ If we find the product of the denominators, we get _____ for the common denominator.

A

$\frac{5}{6} = \frac{20}{24}$

$-\frac{3}{4} = \frac{18}{24}$

$\frac{2}{24} = \frac{1}{12}$

B

$\frac{5}{6} = \frac{10}{12}$

$-\frac{3}{4} = \frac{9}{12}$

$\frac{1}{12}$

2. Look at rows C and E in the fraction table on page 123. You will see that there is a number smaller than 24 that we could have used as a common denominator in box A.

This number is _____. Then we can change the fractions as in box B.

Is the answer in box B the same as in box A? _____

It is easier to use the **smallest common denominator.**

3. In box C, the product of the denominators is _____. Could we use 12 as the common denominator in box C? _____ Is 24 the smallest common denominator? _____

C

$\frac{7}{8} = \frac{21}{24}$

$-\frac{2}{3} = \frac{16}{24}$

$\frac{5}{24}$

Subtract in rows 4 to 8. Be sure all the remainders are in best form.

	a	b
4.	$\frac{3}{4} - \frac{1}{5} =$	$\frac{4}{5} - \frac{1}{3} =$
5.	$\frac{5}{8} - \frac{3}{16} =$	$\frac{1}{2} - \frac{1}{3} =$
6.	$\frac{4}{5} - \frac{1}{4} =$	$\frac{5}{6} - \frac{3}{5} =$
7.	$\frac{11}{12} - \frac{2}{3} =$	$\frac{1}{3} - \frac{1}{5} =$
8.	$\frac{5}{8} - \frac{1}{3} =$	$\frac{1}{2} - \frac{2}{5} =$

9. Sally bought $\frac{5}{8}$ lb. of boiled ham to make sandwiches. Ruth bought $\frac{13}{16}$ lb. of luncheon meat. Ruth's meat weighed how much more than Sally's?

_____

Adding Mixed Numbers with Unrelated Fractions

1. In box A, can thirds be changed to fifths? _____ What is the product of the given denominators? _____

2. Look at the fraction table on page 123. Is there any number smaller than 15 that can be a common denominator for thirds and fifths?

_____

3. To change $\frac{22}{15}$ to a mixed number, we *think*, "$1 = \frac{\quad}{15}$, so $\frac{22}{15} = 1\frac{\quad}{15}$."

If you cannot do this step mentally, write it as side work.

A		B
	Think:	
$5\frac{2}{3} = 5\frac{10}{15}$	$\frac{22}{15} = 1\frac{7}{15}$	$4\frac{1}{4} = 4\frac{3}{12}$
$+ 6\frac{4}{5} = 6\frac{12}{15}$		$+ 1\frac{1}{6} = 1\frac{2}{12}$
$11\frac{22}{15} = 12\frac{7}{15}$		

4. Box B. The product of the given denominators is _____. The smallest common denominator is _____. Finish the work.

Remember: The product of the denominators of two unrelated fractions will always be a common denominator. This may not be the best common denominator because it may not be the smallest.

Add in rows 5 and 6. Be sure your sums are in best form.

	a	b	c	d
5.	$2\frac{3}{4}$	$3\frac{1}{2}$	$4\frac{5}{6}$	$1\frac{3}{8}$
	$+ 4\frac{1}{3}$	$+ 1\frac{3}{5}$	$+ \frac{3}{4}$	$+ 6\frac{2}{3}$
6.	$8\frac{4}{5}$	$9\frac{5}{6}$	$5\frac{2}{3}$	$\frac{2}{5}$
	$+ 2\frac{1}{2}$	$+ 1\frac{7}{12}$	$+ 4\frac{1}{2}$	$+ 2\frac{3}{4}$

7. Sally is to have new curtains for her room. Her mother is trimming them with ball fringe down one side and across the bottom. Each curtain is $2\frac{1}{4}$ yd. long and $1\frac{1}{4}$ yd. wide. How many yards of fringe are needed to trim one pair of curtains?

_____



Subtracting Mixed Numbers with Unrelated Fractions

1. In box A, to subtract $\frac{16}{20}$ from $\frac{15}{20}$, we need more twentieths. We borrow 1 of the 7 wholes and change it to $\frac{\quad}{20}$. Then $\frac{20}{20}+\frac{15}{20}=\frac{\quad}{20}$. Finish the work in box A.

2. In box B, do we need more twelfths to subtract from? _____ Finish box B.

A	B
With borrowing	Without borrowing
$7\frac{3}{4}=7\frac{15}{20}=6\frac{35}{20}$	$8\frac{3}{4}=8\frac{9}{12}$
$-\ 2\frac{4}{5}=2\frac{16}{20}=2\frac{16}{20}$	$-\ 4\frac{2}{3}=4\frac{8}{12}$

Remember: After fractions have a common denominator, decide whether you need to borrow.

In row 3, write the missing numerators.

	a	b	c	d	e
3.	$4\frac{7}{20}=3\frac{\quad}{20}$	$5\frac{7}{12}=4\frac{\quad}{12}$	$8=7\frac{\quad}{16}$	$2\frac{4}{15}=1\frac{\quad}{15}$	$5\frac{9}{24}=4\frac{\quad}{24}$

Subtract in rows 4 to 6. Be careful when you borrow.

	a	b	c
4.	$7\frac{1}{3}$ $-\ 4\frac{1}{2}$	15 $-\ 9\frac{2}{3}$	$9\frac{1}{3}$ $-\ 6\frac{4}{5}$
5.	$2\frac{3}{5}$ $-\ 1\frac{3}{4}$	$8\frac{2}{3}$ $-\ 5\frac{1}{2}$	$6\frac{1}{2}$ $-\ 4\frac{3}{5}$
6.	$8\frac{3}{16}$ $-\ 5\frac{7}{8}$	$10\frac{1}{6}$ $-\ 6\frac{3}{4}$	$6\frac{1}{3}$ $-\ 4\frac{3}{4}$

7. Jim's watermelon weighed $12\frac{3}{4}$ lb. Sam's weighed $19\frac{1}{2}$ lb. Sam's melon was how much heavier than Jim's?

_____

8. Claire cut $4\frac{2}{3}$ yd. of ribbon from a roll that held 20 yd. How many yards were left on the roll?

_____



Getting Ready for Field Day

[*Problems with fractions and measures*]

The children at the Edison School are getting ready for the annual Field Day at the park. Here are some of their problems. See if you can solve them.

1. Joe ran 50 yd. in $9\frac{1}{2}$ sec. Tom did it in $8\frac{3}{5}$ sec. What was the difference between Tom's time and Joe's time?

---

2. Fred has been working hard on the running broad jump. In his best trial, he jumped $11\frac{3}{4}$ ft. In his poorest trial, he jumped only $7\frac{2}{3}$ ft. How much farther did he jump in his best trial than in his poorest trial?

---

3. For four trials in the running broad jump, Paul made these records: $7\frac{1}{2}$ ft.; $9\frac{1}{4}$ ft.; $10\frac{1}{2}$ ft.; and $8\frac{3}{4}$ ft. What was his average for these four trials?

---

4. George worked on the basketball distance throw from 3:55 to 4:25.

How many minutes did he work? _____

What part of an hour was that? _____

5. Nancy and Ruth made arm bands for the 24 children in their class who were to be in the contests. They allowed 15 in. of ribbon for each arm band. How many yards of ribbon did they use?

---

6. At 36¢ a yard, what did the ribbon for the arm bands cost?

---

7. How much did each arm band cost?

Testing What You Have Learned

[*Cumulative Review*]

1. In a to f below, circle the larger fraction in each pair.

a. $\frac{1}{8}$ or $\frac{1}{3}$ b. $\frac{3}{4}$ or $\frac{3}{5}$ c. $\frac{2}{3}$ or $\frac{1}{2}$

d. $\frac{3}{8}$ or $\frac{5}{8}$ e. $\frac{3}{4}$ or $\frac{5}{6}$ f. $\frac{7}{8}$ or $\frac{3}{4}$

2. Circle the fractions below that are already in lowest terms.

$\frac{6}{8}$ $\frac{2}{3}$ $\frac{5}{10}$ $\frac{5}{6}$ $\frac{3}{10}$ $\frac{6}{12}$

3. Circle the fractions below that have a value greater than 1.

$\frac{5}{8}$ $\frac{8}{5}$ $\frac{9}{4}$ $\frac{2}{3}$ $\frac{5}{6}$ $\frac{6}{3}$

4. Circle the fractions below that have a value of $\frac{2}{3}$.

$\frac{8}{12}$ $\frac{9}{12}$ $\frac{4}{8}$ $\frac{4}{6}$ $\frac{6}{9}$ $\frac{10}{12}$

5. Circle the Roman number below that stands for our number 64.

XLIV XLVI LXIV LXVI

In Ex. 6 to 10, circle the answer that is correct.

6. What is the common fractional unit when $\frac{1}{4}$ is subtracted from $\frac{2}{3}$?

$\frac{1}{9}$ $\frac{1}{10}$ $\frac{1}{12}$ $\frac{1}{20}$

7. How many inches are there in $\frac{2}{3}$ yd.?

28 24 27 30

8. 45 minutes equals what part of an hour?

$\frac{1}{2}$ $\frac{2}{3}$ $\frac{3}{4}$ $\frac{5}{6}$

9. Two pounds of potato chips will make how many 4-ounce packages?

4 6 8 10

10. At 4 for a quarter, what is the cost of a dozen favors?

\$1.25 \$1.00 75¢ 50¢

How Accurate Are You?

Do what the signs tell you to do.

	a	b	c	d	e
1.	$9 - 6\frac{4}{5}$	$6\frac{1}{8} - 2\frac{3}{4}$	$7\frac{3}{4} + 5\frac{2}{3}$	$5\frac{1}{2} - 1\frac{2}{3}$	\$60.43 − 19.86
2.	$74\overline{)6,364}$	389×45	$89\overline{)5,343}$	\$8.07 × 69	$86\overline{)\$57.62}$

How Good Are You at Solving Problems?

1. During October, Carl earned money by raking lawns for his neighbors. The box shows how long he worked on 4 Saturdays. At 75¢ an hour, how much did Carl earn raking lawns?

Saturdays	
1st	$5\frac{1}{2}$ hr.
2d	$4\frac{3}{4}$ hr.
3d	6 hr.
4th	$3\frac{3}{4}$ hr.

---

2. What was the average amount Carl earned on a Saturday?

---

3. Henry worked as carry-out boy at a grocery store on 4 Saturdays. In all, he earned $25.20. If Henry worked 7 hr. each Saturday, what amount was he paid per hour?

---

4. Marie earned money selling boxes of Christmas cards. She bought 2 dozen boxes for $18.96 and sold them at $1.00 a box. How much did she make on the 24 boxes?

---

5. Jean did baby-sitting on Friday from 6:00 P.M. to 11:30, and on Saturday from 7:30 to midnight. At 65¢ an hour, how much did she earn in all?

---

6. On August 1, David had $35.67 in the bank. During August, he earned $10.00 and put $\frac{3}{4}$ of it in the bank. How much did he have in the bank then?

---

7. At the end of the year, David (Ex. 6) had $62.12 in the bank. How much had been added after August 1?

---

8. Last year, Earl earned $187.20 from his paper route. This was an average of how much per month?

---

9. Paul sold things he raised in his own garden. He sold 6 squashes at 45¢ each, 5 melons at 30¢ each, and 3 baskets of tomatoes at 75¢ each. How much did he receive for these things?

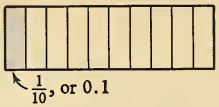
How Well Can You Estimate?

In each of Ex. 1 to 12, circle the best estimate.

1. $8 \times 97¢$	$80; $5; $8	**7.** $62.10 ÷ 30	$100; $200; $2
2. $13.02 − $8.96	$4; $3; $21	**8.** $69.87 + $3.98	$73; $74; $76
3. $31.60 ÷ 8	$5; $4; $3	**9.** $59 \times $1.98	$12; $120; $180
4. $79.95 + $88.16	$17; $200; $170	**10.** $121.60 ÷ 40	$30; $3; $2
5. $30 \times $5.99	$150; $180; $1.80	**11.** $18.76 − $7.54	$11; $12; $27
6. $80.15 − $74.39	$6; $60; $5	**12.** $104.80 + $8.39	$111; $112; $113

Studying Tenths Written as Decimal Fractions

1. What fractional part of rectangle A is colored?



When we write $\frac{1}{10}$ to represent the colored part of A, we write a common fraction. We can also write the **decimal fraction** 0.1 to represent the colored part of A.

2. What part of B is colored?

B



With a decimal fraction we write 0.7 Both $\frac{7}{10}$ and 0.7 are read, "7 tenths." Both these fractions mean seven $\frac{1}{10}$'s.

3. Write in two ways the fraction that tells what part is white

in A _____ in B _____

4. Circles C and D are the same size.

C



D



In C, _____ tenths are colored. In D, _____ tenths are colored. In the two circles, _____ tenths are colored in all.

We can write 19 tenths as the improper fraction $\frac{19}{10}$ or as the mixed number $1\frac{9}{10}$. We can also write it in decimal form, as 1.9

We read 1.9 and $1\frac{9}{10}$ the same way, "one and 9 tenths."

Numbers like $1\frac{9}{10}$ and $4\frac{3}{10}$ are mixed numbers. Numbers like 1.9 and 4.3 are **mixed decimals.** To save time, we often say just "decimals" for both decimal fractions and decimal mixed numbers.

5. Write the missing decimals in each of columns E to I below.

E	F	G	H	I
0.5	1.2	6.2	8.0	4.7
0.6	1.4	6.6	7.5	4.4
0.7	1.6	7.0	7.0	4.1
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

Write Ex. 6 to 15 as decimals.

6. $4\frac{5}{10}$ = _____

7. $\frac{7}{10}$ = _____

8. $7\frac{3}{10}$ = _____

9. $2\frac{4}{10}$ = _____

10. $\frac{13}{10}$ = 1.3

11. $1\frac{1}{10}$ = _____

12. $4\frac{8}{10}$ = _____

13. $8\frac{2}{10}$ = _____

14. $5\frac{9}{10}$ = _____

15. $\frac{25}{10}$ = _____

Write as common fractions or as mixed numbers.

16. 0.8 = _____

17. 1.4 = _____

18. 0.1 = _____

19. 8.3 = _____

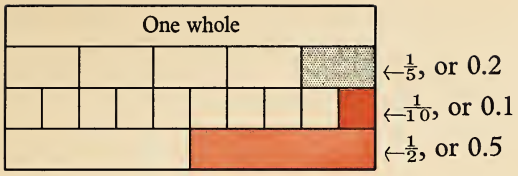
20. 4.6 = _____

21. 16.5 = _____

22. 9.2 = _____

23. 20.7 = _____

Using Tenths



Use the diagram if you need help in writing the missing numbers in Ex. 1 to 6.

1. $\frac{1}{5} = \frac{2}{10} = 0.2$
2. $\frac{2}{5} = \frac{\quad}{10} = \_\_\_\_\_$
3. $\frac{3}{5} = \frac{\quad}{10} = \_\_\_\_\_$
4. $\frac{4}{5} = \frac{\quad}{10} = \_\_\_\_\_$
5. $\frac{5}{5} = \frac{\quad}{10} = 1.0$
6. $\frac{6}{5} = \frac{\quad}{10} = \_\_\_\_\_$

Circle the number that is larger in each pair in Ex. 7 to 12.

7. 0.4 or (4)
8. $\frac{5}{10}$ or 0.6
9. 25 or 2.5
10. 8.0 or $8\frac{1}{10}$
11. 3.7 or 3.0
12. $1\frac{9}{10}$ or 2.0

13. In column B below, copy the numbers in column A in order from smallest to largest.

A	B	C	D
0.9	------	1.8	------
1.3	------	$1\frac{3}{10}$	------
2.0	------	$\frac{17}{10}$	------
1.9	------	0.9	------
0.3	------	0.8	------
0.1	------	$\frac{14}{10}$	------
1.0	------	$1\frac{6}{10}$	------

14. In column D, copy the numbers in column C from smallest to largest.

Read statements 15 to 22 below. If a number needs a decimal point to make the statement sensible, put in the decimal point. Use a red pencil if you have one.

15. Lee walked 2 5 miles in an hour.

16. A freight train had 1 2 4 cars.

17. The candy bar weighs 1 5 oz.

18. The baby weighs 1 2 5 lb.

19. There are 1 4 4 0 minutes in a day.

20. The temperature rose 9 6 degrees from 8 A.M. to noon.

21. The paper reported that 1 8 inches of rain fell in an hour.

22. The living room in Jean's house is about 2 7 feet long.

If you should take out the decimal point in any number below to make the statement sensible, cross out the number and write it correctly.

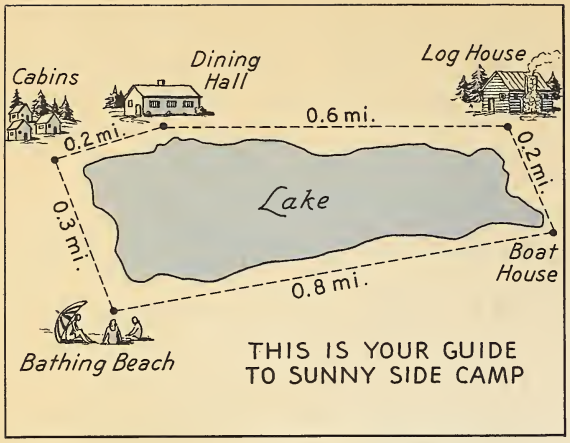
23. Mr. Day's new car can go 1.7 mi. on a gallon of gasoline.

24. The average weight of the chickens Bob sold was 4.5 lb.

25. Ralph's father weighs 18.5 lb.

26. Nick drank 0.5 qt. of milk at breakfast.

27. On a very hot day last summer, the temperature was 9.9 degrees.



1. The map above shows the distances between different places at Sunny Side Camp. How far is it from the cabins to the log house?

Box A shows the adding both with decimals and with common fractions.

In decimal form, the answer is _____ mile. Does 0.8 equal $\frac{8}{10}$? _____

A

0.2	$\frac{2}{10}$
$+\ 0.6$	$+\ \frac{6}{10}$
0.8	$\frac{8}{10} = \frac{4}{5}$

B

^{1} 4.5	$4\frac{5}{10}$
$+\ 3.8$	$+\ 3\frac{8}{10}$
8.3	$7\frac{13}{10} = 8\frac{3}{10}$

2. Box B shows two ways to add 4.5 and 3.8

To add the decimal way, we start at the right. The sum in tenth's column is _____ tenths, or 1 whole and _____ tenths. We write _____ and carry the 1 whole to one's column. Is 8.3 the correct sum? _____

3. Look at the map again. How much farther is it from the bathing beach to the boat house than it is from the cabins to the beach?

Study the work in box C. In decimal form, the difference is _____ mi.

C

0.8	$\frac{8}{10}$
$-\ 0.3$	$-\ \frac{3}{10}$
0.5	$\frac{5}{10} = \frac{1}{2}$

D

$^{4}\cancel{5}\,^{(13)}\cancel{.3}$	$5\frac{3}{10} = 4\frac{13}{10}$
$-\ 2.6$	$-\ 2\frac{6}{10} = 2\frac{6}{10}$
2.7	$2\frac{7}{10}$

4. Box D shows the decimal way and the common-fraction way to subtract with borrowing. Study the work. Which way do you think is easier?

We add and subtract decimals just as we do whole numbers. We write tenths under tenths, ones under ones, and so on.

Add or subtract. Watch the signs.

	a	b	c
5.	14.9 $-\ 2.3$	68.3 $+\ 27.6$	37.5 $-\ 24.7$
6.	18.4 $+\ 3.7$	70.2 $-\ 36.9$	53.8 $+\ 14.2$
7.	80.0 $-\ 4.3$	75.4 $+\ 84.9$	532.1 $-\ 89.6$
8.	604.0 $-\ 137.8$	469.7 $+\ 385.6$	810.4 $-\ 242.9$

Using Decimals in Problems

The table shows how many miles cars A, B, and C averaged on 1 gal. of gasoline on a test run.

Car	Miles on 1 Gallon
A	22.3
B	19.7
C	23.1

1. How many miles farther did car C go on a gallon

a. than car A? ____ b. than car B? ____

2. How many miles farther did car A go on a gallon than car B?

---

3. Steve's uncle drives a truck between two cities that are 78.5 miles apart. How far does he drive in making a round trip?

---

4. How many miles does Steve's uncle drive in making 20 round trips? (Use your answer for Ex. 3.)

---

5. Ed had a board 17.2 in. long. He sawed off a 6.8-inch piece. How long was the piece that was left?

---

6. In 3 trials, Gail ran the length of the school playground in these times:

16.2 sec.; 13.7 sec.; and 15.1 sec.

What was her average time?

---

7. How many feet are there in 0.5 mi.? (0.5 mi. = $\frac{1}{2}$ mi.)

(Remember: 1 mile = 5,280 ft.)

Division Practice

Divide in rows 1 and 2. Check your work by multiplying on another sheet of paper.

	a	b	c	d
1.	$56\overline{)4,200}$	$67\overline{)3,236}$	$48\overline{)2,736}$	$75\overline{)2,900}$
2.	$47\overline{)2,229}$	$66\overline{)4,481}$	$59\overline{)3,802}$	$39\overline{)1,840}$

Measuring in Degrees and Tenths of a Degree



When Paul was ill, the nurse took his temperature with a thermometer like the one in the picture. She told Paul that a well person's normal temperature is about 98.6 degrees.

1. A normal temperature is how much above 98°? _____ It is how much below 99°? _____

2. When Paul's temperature was 101.8°, it was how many degrees above normal?

_____

3. One morning when Henry had the measles, his temperature was 99.8°. By afternoon it was 1.6° higher. What was Henry's temperature in the afternoon?

_____

4. Sally's temperature was 102.4° on Monday morning and 99.8° on Tuesday morning. How many degrees lower was it on Tuesday than on Monday?

_____

5. Sally's temperature (Ex. 4) was how many degrees above normal

a. on Monday morning? _____

b. on Tuesday morning? _____

Study each pair of numbers in Ex. 6 to 12 below. Circle the larger number. Find the difference for each pair and write it on the line, as in Ex. 6.

Which is larger?	How much larger?	Do your work in the space below.
6. 69.5 or 80.3	10.8	
7. 186.2 or 167.8	_____	
8. 200.4 or 198.9	_____	
9. 684.3 or 700.0	_____	
10. 735.7 or 790.3	_____	
11. 310.2 or 276.8	_____	
12. 403.0 or 396.7	_____	

In this chapter, you have learned how to write tenths as decimal fractions. Hundredths can be written as decimals, too. When we write money numbers with the dollar sign and decimal point, we are showing hundredths of a dollar in the decimal way.

Since there are 100 cents in a dollar, 1 cent is $\frac{1}{100}$ of a dollar, or $\$\frac{1}{100}$. In decimal form, $\$\frac{1}{100}$ is written \$0.01

6 cents = $\$\frac{6}{100}$, or \$0.06
30 cents = $\$\frac{3}{10}$, or $\$\frac{30}{100}$, or \$0.30
43 cents = $\$\frac{43}{100}$, or \$0.43
One dollar and 38 cents = $\$1\frac{38}{100}$, or \$1.38

1. Write as common fractions of a dollar.

a. 7 cents _____ **d.** 8¢ _____

b. 13 cents _____ **e.** 57¢ _____

c. \$0.04 _____ **f.** \$0.89 _____

2. Write as mixed numbers.

a. \$1.02 _____ **d.** \$7.10 _____

b. \$2.39 _____ **e.** \$8.05 _____

c. \$3.09 _____ **f.** \$5.70 _____

3. Use decimal points and dollar signs to write these:

a. $\$\frac{5}{100}$ _____ **d.** $\$1\frac{7}{100}$ _____

b. $\$\frac{14}{100}$ _____ **e.** $\$4\frac{25}{100}$ _____

c. $\$\frac{66}{100}$ _____ **f.** $\$6\frac{2}{10}$ _____

4. Write with decimal points and dollar signs. Keep the decimal points in a straight line.

a. 4 tenths of a dollar _____

b. 7 hundredths of a dollar _____

c. 1 and 16 hundredths dollars _____

d. 4 and 9 hundredths dollars _____

e. 3 and 5 tenths dollars _____

f. 49 hundredths of a dollar _____

g. 8 and 60 hundredths dollars _____

h. 2 hundredths of a dollar _____

Now find the sum of these money numbers. _____

Find answers for problems 5 to 7. Be sure to write money numbers correctly.

5. At the railroad station, Mr. Wells bought 3 tickets to Bristol at \$14.58 each. What was his change from \$50?

_____

6. Mr. Johnson's electric-light bill for March was \$5.89. What was the average cost per day?

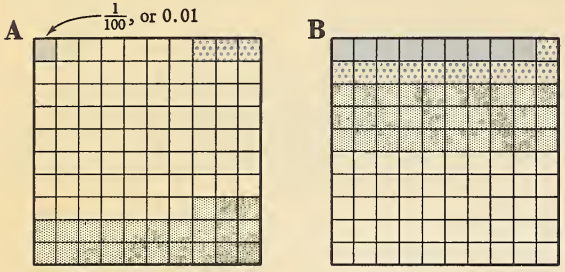
_____

7. Mr. Clark pays his electric-light bill every two months. One year he paid the following amounts: \$10.65; \$8.40; \$5.33; \$6.50; \$7.80; and \$8.24. What was the average amount he spent per month that year for electricity?

_____

Studying Hundredths as Decimal Fractions

1. In square A, there are _____ rows of small squares with _____ small squares in each row. There are _____ small squares in all.



2. What fractional part of square A is solid blue? _____

Any fraction that has 100 for its denominator can be written as a decimal. In decimal form, $\frac{1}{100}$ is 0.01

3. What fractional part of square A is dotted blue? _____

In decimal form, $\frac{3}{100}$ is written 0.03 Both $\frac{3}{100}$ and 0.03 are read, "3 hundredths." They mean three $\frac{1}{100}$'s.

4. What part of square A is gray? $\frac{\quad}{100}$, or 0._____

For square B, write first the common fraction, then the decimal fraction, to represent the part that is

5. Solid blue _____ _____

6. Dotted blue _____ _____

7. Gray _____ _____

8. Square B has _____ rows of small squares. Each of these rows is $\frac{1}{10}$, or 0.1, of square B.

9. In square B, ____ tenths, or 0.5, are white. How many hundredths are white? _____ Does 0.5 = 0.50? _____

10. Write as decimals.

a. $\frac{7}{100}$ _____ **f.** $\frac{35}{100}$ _____

b. $\frac{8}{10}$ _____ **g.** $8\frac{75}{100}$ _____

c. $5\frac{17}{100}$ _____ **h.** $9\frac{3}{100}$ _____

d. $3\frac{2}{100}$ _____ **i.** $4\frac{50}{100}$ _____

e. $5\frac{6}{10}$ _____ **j.** $12\frac{4}{100}$ _____

11. Write as common fractions or as mixed numbers.

a. 0.06 _____ **f.** 8.70 _____

b. 0.6 _____ **g.** 1.07 _____

c. 0.15 _____ **h.** 14.9 _____

d. 4.04 _____ **i.** 20.01 _____

e. 7.4 _____ **j.** 0.45 _____

In Ex. 12 to 19, circle the larger number in each pair.

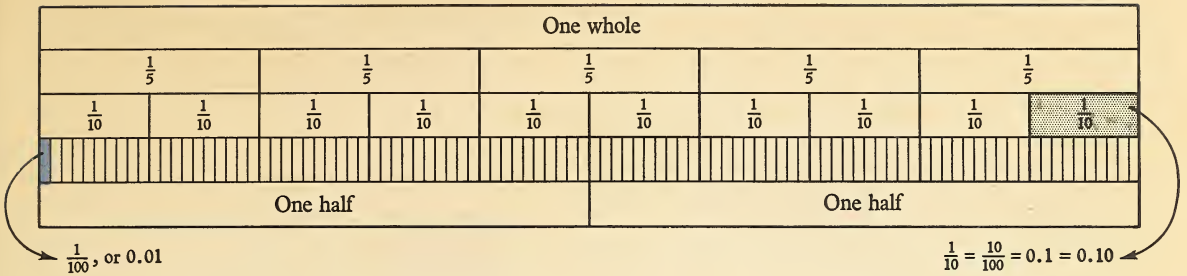
12. 0.16 or 0.61 **16.** 8.99 or 9.00

13. 0.50 or 0.05 **17.** 5.2 or 5.02

14. 0.4 or 0.39 **18.** 6.08 or 6.10

15. 0.79 or 0.8 **19.** 1.49 or 1.5

Studying Equal Decimal Fractions



Use the diagram above if you need help in writing the missing numbers in Ex. 2 to 6. Ex. 1 has been done for you.

	Fractions			Decimals		
1.	$\frac{1}{5} = \frac{2}{10} = \frac{20}{100}$	=		0.2	=	0.20
2.	$\frac{2}{5} = \frac{\quad}{10} = \frac{\quad}{100}$	=	-------		=	---------
3.	$\frac{3}{5} = \frac{\quad}{10} = \frac{\quad}{100}$	=	-------		=	---------
4.	$\frac{4}{5} = \frac{\quad}{10} = \frac{\quad}{100}$	=	-------		=	---------
5.	$\frac{5}{5} = \frac{\quad}{10} = \frac{\quad}{100}$	=	-------		=	---------
6.	$\frac{1}{2} = \frac{\quad}{10} = \frac{\quad}{100}$	=	-------		=	---------

7. Look at the diagram again. Is $\frac{70}{100}$ equal to $\frac{7}{10}$? ---------- Is 0.70 equal to 0.7? ----------

8. By what number do we divide both numerator and denominator to change $\frac{70}{100}$ to $\frac{7}{10}$?

---

9. To change 0.70 to the equal decimal 0.7, we took off the zero at the right (0.7Ø). Is this the same as expressing 0.70 with a larger fractional unit?

---

10. Does $\frac{3}{10}$ equal $\frac{30}{100}$? ----------

Does 0.3 equal 0.30? ----------

(Use the diagram if you need help.)

11. By what number do we multiply both numerator and denominator to change $\frac{3}{10}$ to $\frac{30}{100}$?

---

12. When 0.3 is changed to 0.30, is this the same as expressing 0.3 with a smaller fractional unit?

---

13. Circle the numbers that equal 1.6

$1\frac{6}{10}$ 0.16 $1\frac{60}{100}$ $1\frac{6}{100}$ 1.60

14. Circle the numbers that equal $2\frac{1}{2}$.

2.05 2.50 2.5 $\frac{25}{10}$ $2\frac{50}{100}$

15. Circle the numbers that are $\frac{1}{100}$ smaller than 3.

3.01 2.99 2.9 $2\frac{99}{100}$ 2.90

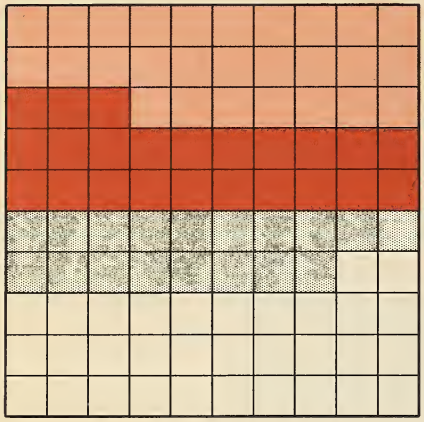
A zero at the right of a decimal fraction may be dropped (taken off) without changing the value of the fraction.

0.6Ø = 0.6 4.80 = 4.8

Annexing (adding) a zero at the end of a decimal fraction does not change the value of the fraction.

0.8 = 0.80 1.4 = 1.40

A



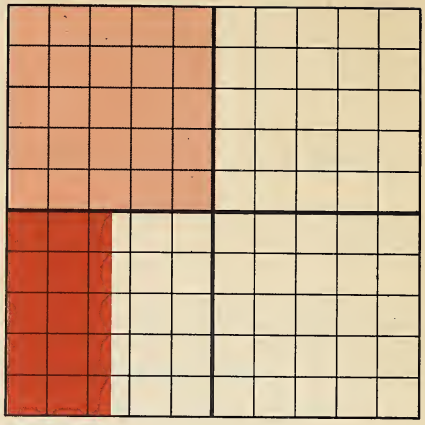
In square A, the pink part may be represented in all the decimal and fraction ways given in Ex. 1. Study these four ways, then write the different ways to represent the other parts of square A.

	Decimal Ways	Fraction Ways
1. 0.27, or $\frac{27}{100}$	0.20 + 0.07 0.2 + 0.07	$\frac{20}{100} + \frac{7}{100}$ $\frac{2}{10} + \frac{7}{100}$
2. 0.23, or $\frac{23}{100}$ (red)	----------	----------
3. 0.18, or $\frac{18}{100}$ (gray)	----------	----------
4. 0.32, or $\frac{32}{100}$ (white)	----------	----------

Show in four ways the meaning of the decimals below.

5. 0.86	----------	----------
6. 0.98	----------	----------

B



7. For square B, write a common fraction and a decimal fraction to show how many hundredths are pink.

------ ------

8. If we divide both numerator and denominator of $\frac{25}{100}$ by 25, we get what equal fraction?

$\frac{1}{4} = \frac{25}{100} = 0.25$

9. In square B, the red part is $\frac{1}{8}$ of the large square. Count small squares and half squares to find how many hundredths of square B are red.

$\frac{1}{8} =$ -------- hundredths, or $0.12\frac{1}{2}$

10. The white part of B is $\frac{1}{2} + \frac{1}{8}$, or $\frac{\quad}{8}$.

$\frac{1}{2} = 0.50$ $\frac{1}{8} = 0.12\frac{1}{2}$

$0.50 + 0.12\frac{1}{2} = 0.62\frac{1}{2}$, so $\frac{5}{8} =$ ----------

11. In B, the pink part ($\frac{1}{4}$) plus the red part ($\frac{1}{8}$) equals $\frac{\quad}{8}$.

$\frac{1}{4} = 0.$------ $\frac{1}{8} = 0.$------

$0.25 + 0.12\frac{1}{2} = 0.37\frac{1}{2}$, so $\frac{3}{8} =$ ----------

Can You Add and Subtract Decimals?

1. In adding or subtracting decimals, we write hundredths under _____, tenths under _____, and so on.

2. Check the work in boxes A to C. To check in boxes B and C, add the remainder to the number subtracted.

A	B	C
79.59 38.42 + 7.89 125.90	801.04 − 198.56 602.48	500.00 − 37.54 462.46

We carry and borrow in adding and subtracting decimals just as we do with whole numbers.

Add or subtract in rows 3 to 5.

	a	b	c	d	e
3.	54.8 +367.9	709.3 −189.6	38.75 +19.98	50.14 −38.95	$90.36 −47.59
4.	875.3 67.9 +483.6	784.39 79.56 +48.09	19.39 56.84 +7.58	6,284.5 1,987.6 +3,542.9	$75.98 36.54 +18.69
5.	6,704.0 −1,958.6	8,010.3 −965.4	804.32 −156.19	701.30 −649.78	$800.00 −56.43

6. The diagram shows three lots that face on Pine Street. What is the total width of the three lots?

_____

7. What is the difference in width between lots 1 and 2?

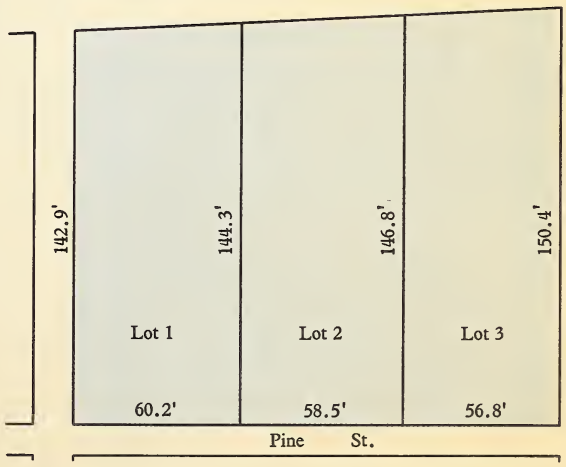
_____

8. Each lot is longer on one side than on the other. Compare the lengths of the two sides of lot 1. One side is how much longer than the other side?

_____

9. One side of lot 2 is how much longer than the other side?

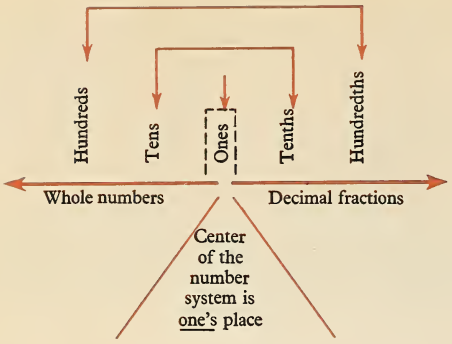
_____



10. One side of lot 3 is how much longer than the other side?

_____

Understanding Place Value



Our number system is a ten-system, or a decimal system. One's place is the center of the system. Study the diagram above.

In writing decimals, we use the decimal point to show where the whole number ends and the decimal fraction begins.

Write the following in decimal form:

1. 6 and 15 hundredths _____

2. 95 hundredths _____

3. 27 and 3 hundredths _____

4. 3 and 49 hundredths _____

5. We can show the meaning of a mixed decimal by taking it apart, as in box A. Find the sum of the parts.

A

27 4.5 9

→9 × 0.01 = 0.09
→5 × 0.1 = 0.5
→4 × 1 = 4
→7 × 10 = 70
→2 × 100 = 200

The sum is _____

6. Take the number in box B apart and put it together again, as in box A.

B

6 9 8.2 3

→3 × 0.01 = _____
→2 × _____ = _____
→8 × _____ = _____
→9 × _____ = _____
→6 × _____ = _____

The sum is _____

7. Look at the numbers in column C below. In column D, write them in order from smallest to largest.

8. In column F, copy the numbers in column E in order from smallest to largest.

C	D	E	F
0.6	_____	1.50	_____
2.02	_____	0.05	_____
0.99	_____	0.5	_____
2.4	_____	5.1	_____
3.00	_____	0.51	_____
1.01	_____	5.00	_____
0.59	_____	0.49	_____

9. Write the number that has 5 ones, no tenths, and 8 hundredths.

_____



Work problems 1 to 5 and write your answers after the problems.

1. When the Allens started on vacation, Mr. Allen bought enough gasoline to fill the tank of their car. The gasoline cost $4.32. What was the change from $5.00?

---

2. The reading on the car's mileage meter was 2,246.8 when the Allens left the filling station. At the end of the day the reading was 2,641.5. How many miles had the Allens driven that day?

---

3. Mr. Reed works in an airplane factory. Sometimes he has to measure things in hundredths of an inch. One day he bolted a piece of steel 0.56 in. thick to a piece 3.79 in. thick. How thick were the two pieces together?

---

4. Judy and six of her friends went to the movies. In all, they spent $3.15 for tickets. How much did each girl's ticket cost?

---

5. Jack colored 0.18 of a square red and 0.67 of it blue. In all, what part of the square was colored?

Read statements 6 to 15 below. If a number needs a decimal point to make the statement sensible, put in the decimal point. Use a red pencil if you have one.

6. On a 2-day trip, Jerry and his family drove 6 8 9 5 miles.

7. Ruth's mother canned 2 5 bushels of peaches.

8. It took Harry 2 2 5 hr. to mow the lawn.

9. Mr. Black's new car cost $ 2 3 5 0.

10. When Mary was sick, her temperature was 9 9 8 degrees.

11. Jean earned $ 2 9 last year.

12. Fred is 6 0 inches tall.

13. Helen wants to buy a new sweater that costs $ 3 9 8.

14. Sally weighs 8 2 lb.

15. The knife weighs 2 5 ounces.

Practice in Multiplication and Division

Multiply in rows 1 and 2. To check, do the work again.

	a	b	c	d	e	f
1.	919 × 8	706 × 4	3,728 × 6	9,005 × 9	5,080 × 7	8,623 × 5
2.	370 × 26	847 × 39	2,008 × 57	1,764 × 40	5,943 × 72	9,070 × 80

Divide in rows 3 to 5. Check on another piece of paper.

	a	b	c	d
3.	$13\overline{)546}$	$39\overline{)3,268}$	$23\overline{)865}$	$17\overline{)938}$
4.	$26\overline{)15,938}$	$19\overline{)3,648}$	$57\overline{)38,475}$	$54\overline{)9,657}$
5.	$39\overline{)\$29.25}$	$35\overline{)\$149.45}$	$56\overline{)15,375}$	$43\overline{)\$10.32}$

Testing What You Have Learned

[*Cumulative Review*]

1. Circle the number that is larger in each of the following pairs:

a. $\frac{3}{4}$ or $\frac{5}{6}$ **d.** $\frac{9}{5}$ or 2

b. 0.8 or 1.0 **e.** 0.89 or 0.9

c. 5.4 or 5.5 **f.** 2.4 or 2.04

2. Circle the numbers equal to 2.5

5.2 $2\frac{1}{2}$ $2\frac{1}{4}$ 2.50 0.25 $2\frac{5}{10}$

3. Circle the numbers below that are larger than 1.

$\frac{9}{8}$ 1.08 0.98 $\frac{8}{9}$ 1.11 0.11

4. $\$\frac{8}{10}$ equals how many cents? _____

5. $\$2\frac{3}{4}$ equals how many quarters? _____

6. $\$1\frac{75}{100}$ equals how many cents? _____

In Ex. 7 to 16, find the value of *n*.

7. $\frac{3}{4} + n = 1\frac{1}{4}$ n = _____

8. $4 - n = 3\frac{1}{5}$ n = _____

9. $n - \frac{2}{3} = \frac{2}{3}$ n = _____

10. $n + 0.01 = 2.05$ n = _____

11. $7.5 + n = 8.0$ n = _____

12. $2.7 - n = 2.4$ n = _____

13. $n = \frac{4}{5}$ of \$20 n = _____

14. $\frac{7}{8}$ of $40¢ = n$ n = _____

15. $9.00 - 0.72 = n$ n = _____

16. $n = \frac{2}{3}$ of 27 n = _____

How Accurate Are You?

Do what the signs tell you to do.

	a	b	c	d	e
1.	$78\overline{)\$76.44}$	$4.15 + 0.96 + 8.79$	$18.03 - 9.57$	$\$9.37 \times 89$	$6\frac{1}{5} - 4\frac{1}{2}$
2.	$19\overline{)13,357}$	$38.1 - 19.4$	648×103	$37\overline{)19,684}$	$3\frac{1}{2} + 2\frac{1}{3} + 1\frac{5}{6}$

How Good Are You at Solving Problems?



1. The Outdoor Club went camping. To get to camp, the boys rode 15.9 mi. on the bus; then they hiked 3.8 mi. They went home the same way. The round trip was how many miles?

---

2. The camp was 16.4 mi. from Mayville and 6.9 mi. from Parktown. It was how much nearer to Parktown than to Mayville?

---

3. Don bought 3 bus tickets at $1.27 each. What was his change from $5.00?

---

4. The average temperature for December in the city where Ann lives is 56.2 degrees. In the city where her cousin Fred lives, the average December temperature is 20.8 degrees. What is the difference in the average December temperatures of these two cities?

---

5. The total amount of rainfall each month from June through September in the town where Sally lives is shown in the box.

June	4.6 in.
July	2.2 in.
Aug.	3.4 in.
Sept.	5.8 in.

What was the average monthly rainfall?

---

6. On September 1, Dave's father paid 29.8¢ a gallon for gasoline. Six months later, he paid 32.3¢ a gallon. How much had the price of a gallon of gasoline gone up in 6 months?

Can You Choose Sensible Answers?

Of the three answers given after each exercise, circle the one that you think is sensible.

1. Mary's kitten weighs _?_ lb.

3.5 35 35.0

2. Sam walked _?_ mi. to the store.

17 1.7 17.0

3. A 10¢ candy bar weighed _?_ oz.

125 1.25 12.5

4. It took _?_ gallons of gasoline to fill the tank of the car.

14.8 148.0 148

5. Mother used _?_ lb. of hamburger for 3 people.

5.7 7.5 0.75

6. The water in the skating rink was frozen this morning. The temperature was _?_ degrees.

56 34 21

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14	[illegible]
15	28[illegible]
16	30 (o[illegible]
17	35[illegible]
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19	[illegible]
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